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# Management Dige

BUSINESS SLUMP IN '58?
Pages 7, 11, 30

Taniguichi of Japan: Higher productivity at home = more competitive goods abroad — p14

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# Management Digest.

THE BEST FROM 68 BUSINESS MAGAZINES

DECEMBER 1957

VOL. 12 NO. 12

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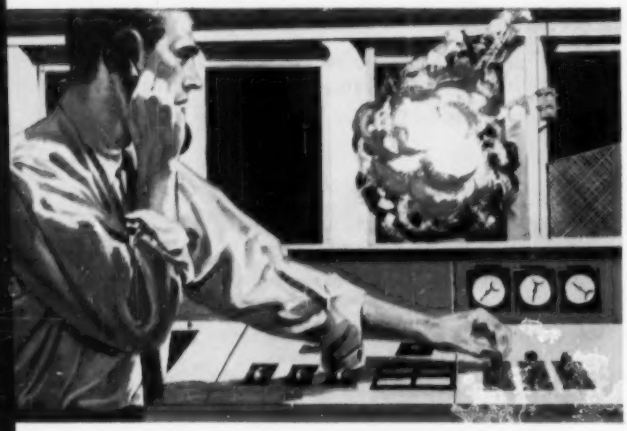

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NEW YORK CITY

DECEMBER 1957

# A Fallible Forecast for 1958

NOTHING is more fallible than economic forecasting. Nothing could be more foolish than to base all one's plans on the short-term outlook.

With that said, we will indulge in some short-term forecasting. As you look around the world, there is little doubt that some of the air is being let out of the business boom. Signs are everywhere (pages 11, 30) that the rate of industrial growth is slowing.

The hope, of course, is that it is merely a slowing-down, not a halt or a downward plunge. Fortunately, the first alternative appears by far the most likely.

A slow-down will not be pleasant, especially for nations struggling to build their industrial plant and raise living standards. Yet some believe that it is just what the world economy needs. Many investors, businessmen, and workers were—even before sputnik—"moonstruck" by the vision of constantly-rising profits, production, and wages. Maximum expansion has been the order of the day, with little thought for price stability or whether every expansionist move was soundly based. If some of the whipped-cream topping is skimmed from the boom, we may all be better off over the long run.

But there is no room for complacency. Much will depend in 1958 on how boldly and responsibly governments and managers in every nation organize their affairs to counteract troubles.

Special responsibility in 1958 will fall on the creditor nations—and that means the U.S.A. above all (page 7). The Americans have suffered several blows to their confidence in the months past, and these events—whether in Little Rock, Wall Street, or Outer Space—have created an uneasy feeling abroad.

We do not know precisely how the American economy will behave, nor do we presume to predict the exact course of American policies in the year ahead. But we do suspect that the U.S. economy is a lot tougher, and the nation's policies more flexible, than many pessimists—here and abroad—are inclined to believe.

## A Welcome—and a Pledge

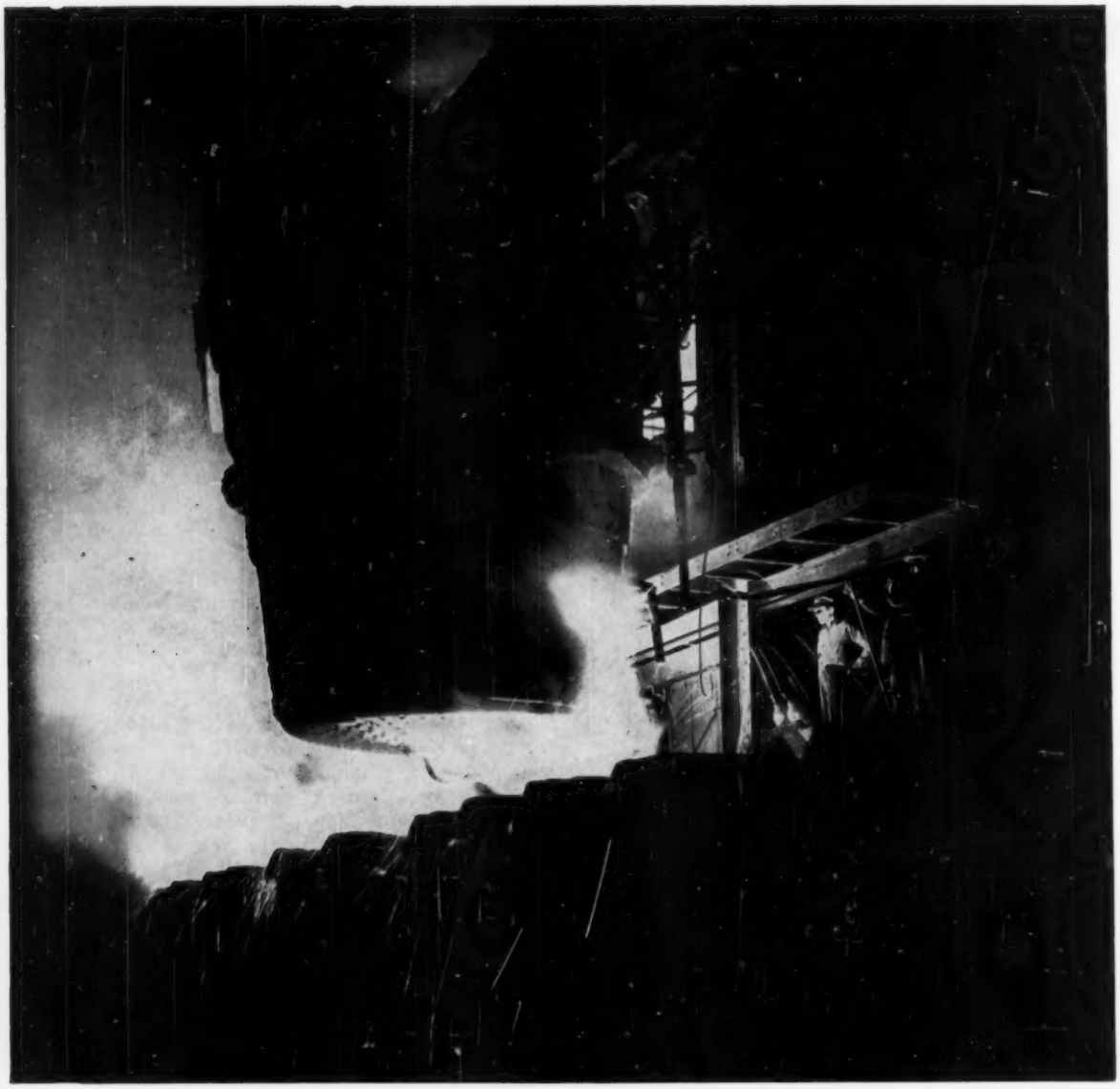
AT times, the activities of the world's largest business publishing house amaze even its employees (all 4440 of them). Did you know that in 1957 McGraw-Hill published 40 different business journals (not including books) daily, weekly and monthly, and that almost 600 editors, plus 550 part-time correspondents, produced over 50,000 editorial pages for 1.5-million readers, travelling 3.3-million miles and making 52,000 editorial calls in the process?

Wait a moment! That will be 41 business journals. Next month, McGraw-Hill launches a unique new magazine called Purchasing Week. It is a weekly newspaper for purchasing executives in business and industry. It will be edited to keep them up to the minute on price trends in commodities and hard goods, and on government and business developments world-wide that will affect those prices; it will report on new products, new designs, and the management problems of purchasing.

While Purchasing Week is edited primarily for Americans, it will produce some useful information for everyone. Again, MANAGEMENT DIGEST will "do the worthwhile reading for you," and adapt from the new magazine material of value to businessmen overseas.

So, to Purchasing Week, welcome. And to the readers of MANAGEMENT DIGEST, our pledge to produce a more useful magazine, and our sincere wishes for a happy and successful 1958.

Paul R. Miller, jr



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706

# ▶ WORLD TRENDS

## EYE ON THE MOONS

The sputniks dramatized the brilliance of Soviet missile technology. But they also have helped revitalize the Western alliance.

**Already, there is a new atmosphere of cooperation between the U.S.A. and the United Kingdom.**

Out of this grew President Eisenhower's decision to attend the North Atlantic Treaty Organization's meeting in Paris this month. Eisenhower hopes NATO will acquire a "new look," and mobilize its great resources.

Watch for Secretary General Spaak's plan to give NATO an economic commander-in-chief. The idea is to better coordinate the members' defense spending, fiscal and foreign economic policies.

**Such an economic pulling-together will not be easy to attain.** But many feel it is essential—more so if there is a business downturn (page 11).

To meet such a threat, a two-part prescription is being studied quietly in Washington.

**1) The three major monetary powers**—the U.S.A., Britain, Germany—must constantly adjust their policies to maintain a close balance in their external trade and payments. If they let themselves get too far out of line, the strain on international reserves will be unbearable. If they stay in balance, swings in trade and payments of other nations can be covered by the three's reserves, together with those of the International Monetary Fund.

**2) The two big creditor nations**—the U.S.A. and Germany—should make large loans to the IMF. The money could then be loaned to countries in trouble. The two should also foster private foreign investment and government aid programs.

**Much responsibility devolves on the U.S.A.** And you can see signs that the sputniks, and the world business outlook, are having an effect.

Officials who have long been urging more aid and trade are getting a better hearing in Washington. Vice President Nixon is taking a personal part in drafting a larger, more liberal program in 1958.

He wants **heavier grants of dollars** to less-developed nations. He is urging **special tax benefits** to encourage more American investment abroad. And he insists that the **reciprocal trade agreements act be extended** for five years instead of three, with **new authority to reduce tariffs.**

This will be the most difficult piece of legislation to get through the 1958 Congress. But it is encouraging to the "free traders" that the Administration is going on the offensive early.

## COFFEE NERVES IN LATIN AMERICA

**"Here it comes again,"** comments an economist who has seen Latin American crises come and go.

"Coffee Keeps Brazilians Awake," headlines Business Week. It is not the caffeine, however. Rather, supply and demand is causing sleepless nights—in Colombia and Central America as well as in Brazil.

Attempts to reverse the tumbling price of coffee ended up more as a rearguard action to prevent a market collapse. Meeting in Mexico City

**Turn the page for more WORLD TRENDS**

in October, the coffee producers agreed to withhold some 15% to 20% of this year's crop and to continue price supports.

The pact is scheduled to last until next September, but how long it will actually last is a matter of speculation.

**The coffee processors in the U.S.A. have the growers on a hot seat.** They are importing more African beans; and African producers are not parties to the pact. Processors see plenty of beans on hand, and they are skeptical of Latin American cooperation in such a scheme. The main reason: Brazil and Colombia cannot afford to withhold much coffee.

**Brazil's foreign exchange reserve is at rock bottom.** The cruzeiro is at a two year low and falling. Industrial growth has increased necessary imports—petroleum, for example, requires $250-million to $350-million a year. The debt backlog is heavy. And now, after a year of relatively less inflation, wage pressures are building up behind prices.

The hard fact: Brazil earns 70% of its foreign exchange from coffee.

**Colombia is in the same boat.** Just look at its debt burden: Colombia is pledged to repay back debts at the back-breaking rate of $120-million a year. And coffee exports account for 67% of its foreign exchange. Add to that the economic troubles in Argentina, the strains on other raw material producers such as Chile, Peru, Bolivia, and you can see trade difficulties ahead.

## WORLD ATOM AGENCY AT WORK

**The International Atomic Energy Agency has gone to work.**

IAEA's job will be to aid all member nations in the development of nuclear power. It will allocate fissionable material, set up health and safety standards, and arrange financing for nuclear projects. The U.S. government has given its full backing to the program.

But many questions are unsolved: What countries will build the world's atomic plants? Who will pay for them? What type of plants will be built? To what extent will they be home-built, and to what extent imported?

As it gets rolling in 1958, the first task of IAEA will be to help members set up research projects. Other first-year goals: machinery for the supply of fissionable materials, the free exchange of information, the loan of technicians.

**England and the U.S. have a running start in building the free world's reactors.** But watch the Germans and French, and other members of the six-country Euratom pact (MD, Jan. p 7) make a strong effort to catch up over the next five years.

The near-tragedy at Windscale, when a plutonium pile became overheated and scattered radioactive material over the countryside, hurt British prestige. It hasn't weakened their argument in favor of plutonium.

Europe's scientists prefer plutonium—rather than enriched uranium (U-235)— because it can be chemically processed in Europe, then combined with natural uranium available from Belgian Congo and Canada.

**American firms are now taking a second look at their prospects overseas.** Problem: Not many countries have the bankroll to order giant American-made atomic power plants.

The strategy will be evident in the next few months—more and more alliances between American and foreign engineering firms. The Americans will offer specialized techniques, patents, fuel elements, and often the basic reactor cores. Their partners will supply furnace shells, heat exchangers, complex process lines and instrumentation.

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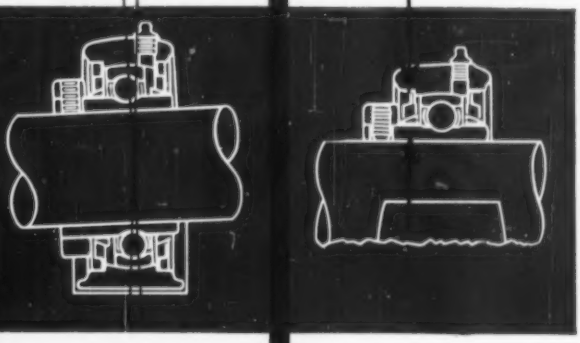

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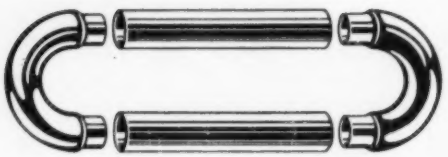

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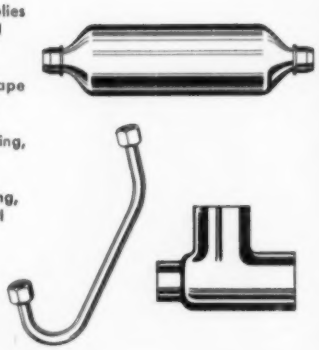

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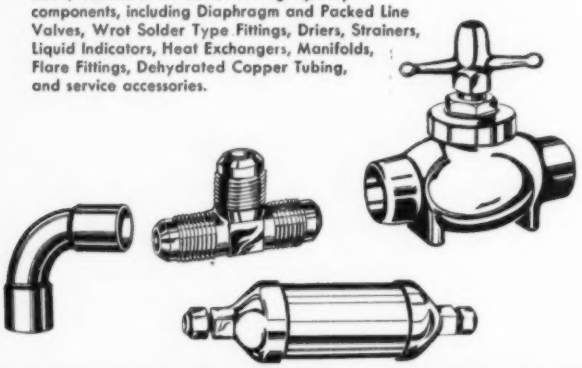

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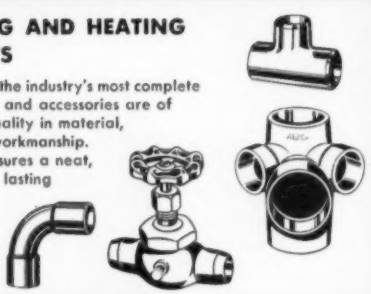

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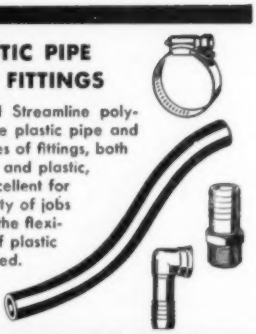

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# Slump?

**The world business outlook for 1958 is cloudy, and storm warnings are flying. Other nations may be more vulnerable to a business recession in the U.S.A.—if it comes.**

TALK ABOUT 1958, and all eyes swing to the U. S. A. No other national economy, or group of economies, bulk so large in the world's business. No other nation could export a recession of its own as a world slump.

This is the season for business forecasts in the U. S. A. The October and November pronouncements of American businessmen and economists were studded with phrases like *business caution, readjustment, business plateau, softness, recession.* There was worry in the U. S. A.—though not yet great alarm—as MANAGEMENT DIGEST went to press.

No question that warning signals are flying:

**—The stock market,** moving down since July, may be paying the price for several years of overoptimism. Still, it is reacting to general business indicators, and reflects the uneasiness of investors (see page 30).

**—Industry's capital spending** budgets for 1958 are estimated to be 7% below 1957's $38,000-million. Orders for machine tools, other capital goods, have been dropping steadily.

**—Exports,** a major prop under domestic business, show signs of slackening; imports are under pressure.

**—Other "weather-vane" indicators**—steel scrap prices, railroad freight traffic, manufacturing employment—point down.

All suggest that the slow-down could become worse before it improves. Yet the mood of businessmen looking at 1958 has been one of restrained optimism, with hopes for an up-turn late in the year.

The optimists suggest that a recession is going on right now, and has been for some months. It is a "business plateau," to be sure, but a plateau of general prosperity. They reason that Washington's "tight money" policies will become less tight. They point out that the stock market decline was inevitable—a "healthy shake-out." They remind you that a 7% drop in capital spending still leaves a very powerful business stimulant, well above 1955, not far below 1956. This, too, was inevitable: Business simply could not keep adding so heavily to plant and equipment without time for consolidation.

The optimistic observers note that spending by state and local governments (and by the Federal government, as the implications of *sputnik* sink in) promises to be strong, and that construction—especially home building—may be improving.

**Above all, students of the American economy point to The Consumer.** Throughout the year, personal income has been high, consumer spending for soft goods and services heavy. All the consumer need do, say the optimists, is to maintain his present spending, and slowly but surely the economy will steady. If he increases his purchases just a bit, the stage would be set for a new up-surge in business activity.

*The Economist* of London recently looked back to the 1953-1954 U. S. recession, which evaporated under the impact of consumer spending: "It is not impossible that, as in 1953-54, the American consumer may be coming to the rescue of the world economy."

**Will the world need rescue? Most observers believe world business is vulnerable now, more so than in 1954.** In every area, the rate of expansion since 1945 has been unusually high, higher than could be maintained indefinitely. Investment, production, consumption has soared; industrialization by less-developed countries has been pushed to the limit.

Much of the 12-year-boom may have been financed by impermanent factors—a heavy reliance on savings forced by price inflation; war-accumulated dollar and sterling balances; the Korean boom; U. S. aid; government stockpiling. These stimulated inflationary expansion, based on the assumption of a constant, steady growth of demand—especially in the U. S. A.

Now, many of these expansion factors are weakening. Governments are finding that they are unwilling (or unable) to accept more inflation, and money is kept tight. Industrial expansion is slowing: raw material prices have slipped badly. The falling incomes of primary producers cannot help but have an impact on world trade.

**Thus, world trade in 1958 seems vulnerable,** and more so because of what the economists call an "international liquidity crisis." There is just not enough gold, dollars, and credit to finance the present high level of trade. The situation is aggravated by the loss of foreign dollar reserves to the U. S. A. (MD, Oct., p.7).

The question is whether these circumstances will (1) combine into a resounding, disastrous "bust" in world business, or (2) work themselves out in a gentle, temporary decrease of activity.

The question is unanswerable now. A lot will depend on the policies of the major monetary powers—the U. S., Britain, Germany (page 7). And while the second alternative above seems more likely, the situation leaves no room for complacency. ●

**Digested from The Economist, Oct 26, p283, 325; Business Week, Oct 19, p35, 42, 126; Oct 26, p35.**

TINY JANUS seats its passengers back to back with 1-cyl. air-cooled engine between them.

**The "500" (left) is Fiat of Italy's entry in European baby-car derby, a race by the automakers to tap a growing world market for cheaper, more convenient transport.**

# Midget Motors: Will They Put the

IN ITALY, Fiat is turning out three versions of its "baby" car at a rate of 900 daily. Germany's Goggomobil says it has sold over 75,000 tiny "Goggos" to date. The unlikely-looking Isetta 300 is on sale throughout Europe, made under license in Britain and Brazil, and is displayed on New York's elegant Park Avenue just a few doors away from its glittering compatriot, the Mercedes-Benz.

You had only to attend the three European motor shows this autumn to see that the "baby" or miniature car (defined as having 600 cc. displacement or less) is here to stay. At the Frankfurt exhibition, for example, the babies accounted for the greatest number of new models. And more are being "hatched" each month, by major automakers and by independent designers in small shops.

**Clearly, the baby cars aim at the growing mass market for low-cost transport, in Europe and elsewhere.** The scooter replaced many a European's family bicycle in the early 1950s. Now the small car maker hopes to upgrade the consumer once again, put four wheels under his feet and a roof over his head.

Novelty, convenience, low price, economy operation—these are the selling points. The baby cars seem to flourish best in countries where road tax and insurance are based on size of engine, not on net sales price. (Some baby cars in Germany cost more than the larger, mass-produced Volkswagen. Their appeal, of course, is in their rock-bottom maintenance and operation expense.) They seem to thrive equally in Germany with its monotonously straight highways and Italy with its twisting mountainous roads. You begin to see them in the U.S.A., where more than one executive drives his bug-like Isetta 300 to the station each day to catch the commuter train. Strangely, perhaps, the baby cars' use in traffic-congested British cities has hardly been explored.

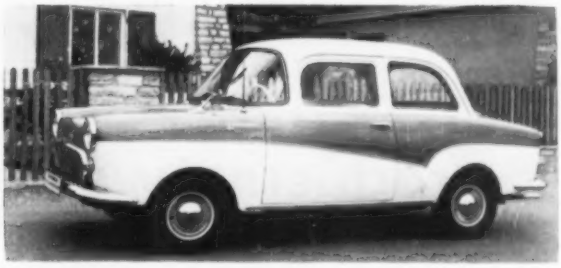
**Diversity seems to be the keynote now**—as might be expected when motor-cycle and scooter manufacturers like NSU, Bianchi, BMW, Piaggio, Zundapp enter the market. Zundapp's little "Janus" takes its name from its ingenious back-to-back seating; Isetta's steering wheel folds forward when the door is open; the British Frisky at first featured wing-doors. On the other hand, both Goggomobil and BMW-Isetta aim for comfort rather than novelty in their 600 models, stressing greater power and larger rear seats. Auto-Union's DKW 600, acclaimed at Frankfurt, is styled not unlike U.S. automobiles.

Certain common design features stood out at the European exhibitions. Air-cooled, 2-cylinder rear engines predominated; overhead valve, 4-stroke seems to be replac-

PIAGGIO of Italy enters the miniature car market with the Vespa 400. Sales will at first be confined to France.

2 C. V. CITROEN, a familiar sight on French roads, has proved a godsend to tax-ridden motorists.

DKW 600 shows U. S. styling influence. Made in Germany, it has a 2-cyl. engine and maximum speed of 110 k.p.h.



GOGGOMOBIL 600 also shows the signs of U. S. influence, may be marketed in U. S. by Studebaker-Packard.

# Masses on Wheels?

ing the 2-stroke engine in the interests of economy and comparative silence. In the future, the design of baby cars will probably follow the lines of comfort and convention—with 2-door saloon bodies, all-round independent suspension, rear mounted 4-stroke engines.

**What about the baby car's market outlook in the U. S. A.?** You hear more and more harried Americans (searching in vain for parking space) complaining that while their autos get longer, heavier, more expensive, the European cars become smaller, lighter, more economical. Their complaints have been backed by a growing taste for imports—witness Volkswagen's stunning success and the nearly 200% increase in Britain's 1957 sales in the U. S. A. Last year, total imports of autos were 100,000; 1957 promises imports of close to 200,000.

Of that 200,000, only a few will be the truly miniature cars. It may be that there is a size—say that of the Volkswagen—below which Americans are not likely to buy. On the other hand, there are reports that the Goggomobil will soon be imported and marketed by Studebaker-Packard.

**Meanwhile, the great debate in the U. S. industry continues:** Will the auto companies continue to import small European cars (such as General Motors Corp. and Ford are doing) or will one eventually gamble on a Made-in-U.S.A. design?

If, as some observers predict, annual sales of small imports reach 400,000 to 500,000 in the next few years, the American manufacturers may move. Right now, they are watching and waiting.●

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**Digested from The American Automobile, Oct, p30; Nov, p38; The Economist, Oct 19, p14; and other sources.**

BERKELEY sportscar is typical of Britain's share of baby car market.

BMW ISETTA 300, has a one-cyl. engine tucked away in the rear.

MEN WITH A MISSION: Kohei Goshi (left), executive director of Japan Productivity Center, considers his work a crusade to raise living standards. Experts like Nobuo Noda (seated, right) work closely with JPC's researchers.

# 1. Productivity at Home

## Can the "productivity" drive create a more efficient, competitive industrial community in Japan?

**Pro'duc-tiv'ity,** noun. *Quality or state of being productive; productiveness; as in literary, racial, or economic productivity.*

Only a few years ago, hardly anyone in Japan knew the meaning of the word "productivity." But today, it is being discussed in the press, at labor union meetings, in businessmen's clubs. The concept of raising productivity—output per man per hour—is being hailed by some as the answer to virtually all Japan's problems, or damned by others as a "capitalist" trick to "enslave" the worker.

The Japanese Productivity Center is, to a large degree, responsible for all the talk. Though it is just two years old, it hopes to spark a new "industrial revolution" that Japan needs to establish the foundations for long-range prosperity.

The Japanese Productivity Center (JPC) is a private, non-profit organization modeled on the European centers set up under the Marshall Plan. At the start, in 1955, the U. S. government was virtually the only backer. Today, private contributions and Japanese government subsidies are taking over more of the burden.

In its short lifetime, JPC has—

**—Sent almost 1,000 Japanese businessmen** on tours of U. S. industry, and invited some 60 U. S. experts to study productivity problems in Japan.

**—Made local productivity consultants available** to Japanese businesses.

**—Promoted the importance of higher productivity,** and better labor-management relations.

Any company can request from JPC a trip to the U. S. A., or a visit from a consultant in Japan. The applications are considered in the light of that company's prospects for increasing efficiency. Sometimes the JPC takes the lead in organizing a tour, working through an industrial trade association.

TADASHI ADACHI, the president of Radio Tokyo, heads JPC's board.

Many businessmen who visit the U. S. (however skeptical they may be of the productivity program at first) return to Japan stimulated by what they have seen. Take the managing director of Nihon Seika Shoe Co. Using a plant he had seen in America as a model, this manager has turned his own establishment into what is probably the most efficient shoe plant in Japan, increasing production speed by 20%.

**Equally important in spreading the productivity gospel** are the visits in Japan by American experts. After touring individual factories, these men hold meetings set up by JPC's Tokyo headquarters, or by JPC offices in Osaka, Nagoya, Fukuoka, Sendai.

This helps JPC promote exchange of productivity information among Japanese companies and locate companies where help is needed. In one case—a rubber manufacturer who had gotten into difficulty with labor and hours laws—JPC experts helped to increase productivity by 50%, permitting shorter hours and higher wages despite a $38,000 investment in handling equipment.

JPC has an impressive infor-

mation program, including reports of Japanese business missions overseas, a weekly productivity newspaper, translations of foreign information, cinemas and exhibitions, courses for management and labor.

**The JPC program faces severe obstacles.** Primarily, they revolve around (1) a mutual distrust between worker and manager; and (2) the problems posed by overpopulation and the traditions of Japanese business.

Progress is being made—slowly—in reducing the first obstruction. Some Japanese labor unions are shifting from outright, politically-inspired opposition to the productivity program to qualified acceptance. This improvement is partly due to the mixed character of JPC's directors—management men, labor leaders, teachers, economists.

Perhaps the most effective catalyst of the productivity drive is JPC's Executive Director, Kohei Goshi (picture, page 14). A short, round-faced economist, he was an architect of his country's postwar industrial reconstruction. Goshi is a former Protestant clergyman, and sees the productivity program as an almost sacred mission. "A French scholar," Goshi says, "once defined productivity as a 'state of mind.' Our first job is to help put people in such a state of mind."

Another important JPC executive is Vice President Ichiro Nakayama, an economics professor. Chairman of the government's Central Labor Relations Committee, he is an experienced mediator, respected by worker and manager alike. Leading industrialists at JPC are its President, Tadashi Adachi (President of Radio Tokyo) and Vice President Shigeo Nagana (President, Fuji Iron & Steel). Other JPC directors include officers of trade unions.

**In general, the management men have more influence** on JPC policies than do the labor leaders. But, paradoxically, these industrialists behind JPC come from the older, more conservative Japanese business community. Young managers are missing, perhaps because of the strict seniority system of Japanese business. Also, many young men in Japan have been brought up in a period of tight government controls, and may not have the competitive spirit that is so necessary for a productivity drive.

Actually, few Japanese have this spirit. The reason may lie in the nation's basic over-population problem. This tends to burden Japan's industrial system with many customs of feudal days. Thus, paternalism in labor-management relations is carried to an extreme, with staffs over-large, dismissals rare, worker interest in labor unions superficial.

Moreover, modern industry has not replaced the small, hand-labor "home" factories. One of the principal aims of JPC is to modernize these small establishments, make them economic enterprises.

**In the past, cheapness of labor has compensated for the low productivity of Japan.** Now times are changing—the past few months' strikes for higher wages are a sign of that. And one of JPC's central problems is to help overhaul the system without committing what to many Japanese is a moral crime—dismissing employees.

**BUY JAPANESE: Trade center in New York, one of several around the world, lures buyers with frequent shows—such as display of quality Japanese foods.**

# 2. Higher Quality Abroad

The Japanese Productivity Center cannot work a miracle overnight. But it is leading Japan in the right direction. Slowly but surely, JPC hopes its efforts will improve the nation's competitive position in world markets.

But Japan is not waiting for a productivity "revolution" at home to improve its business abroad. In 1958, the Japan External Trade Recovery Organization (JETRO) will speed up its program—emphasizing the quality of Japanese goods, increasing its market research and trade promotion around the world.

**In some ways, JETRO's mission resembles that of JPC:** Both are trying to sell new concepts of doing business to Japanese management. JETRO differs in that a large part of its job is devoted to convincing foreign customers to "buy Japanese."

Mikisaburo Taniguichi (cover picture) is one of the key men in the field for JETRO. As director of the Japan Trade Center in New York, he must promote Japanese goods in the U.S.A.—reporting back to Japan on the acceptance of these goods, and the changing tastes of the market. Taniguichi has counterparts in Toronto, San Francisco, and Cairo—where Japan already has trade centers; next year, there will be new centers, in cities like Vancouver, Mexico City, Sydney, Beirut. Many cities that do not have full-fledged centers have JETRO market researchers at work.

All feed information back to Japan. Occasionally, JETRO offices will have special trade shows (picture, above), or will send foreign buyers to Japan. In 1958, JETRO plans to open several "design centers" in Japan to help manufacturers there understand the needs of overseas markets.

**JETRO was born of Japan's**

**postwar realization that its salvation lay in more exports, to new markets.** There has been important progress: Overseas sales have risen from $850-million in 1950 to $2,500-million in 1956. The current Japanese fiscal year promises close to $2,800-million in exports.

But such export gains cannot be sustained merely by increased sales of traditional products—such as the cheaper textiles. The nation must produce quality goods with higher price mark-ups, a generally higher labor content, and a stronger competitive appeal.

**There are already some individual export success stories:** cameras, quality chinaware, sewing machines, transistor radios, shipbuilding, high-styled silks and woolens.

Today, JETRO gives guidance and encouragement to quality-control operations demanded by the government. Every export item is supposed to be checked. Unfortunately, some products of smaller firms are inferior in quality, owing to haphazard inspection. This situation, while it is improving, slows down Japan's campaign to win a reputation for quality.

**Another Japanese problem is price.** Many foreign buyers expect lower prices in Japanese products. And since most exports are sold through the big trading companies, price rather than quality is stressed in sales negotiations, no matter how superior the product may be. The trading companies, dealing in hundreds of items, simply are not equipped to promote individual products.

This is why some Japanese manufacturers have begun to sell directly—and successfully—to foreign importers, retaining control over promotion and marketing.

While some U.S. and European competitors complain about Japan's low prices, buyers in Southeast Asia—a prime potential market—say that Japanese prices have become too high. Japan finds it hard to compete with Indian textiles and certain European goods in this area. It is also difficult to sell Japan's capital equipment—much improved in quality—in South Asia, partly because of higher prices, but also because customers are used to the dependability of Western equipment. ●

## Management Men at Work

**Meet the French manager. His education, his attitudes, shape the business life of the nation. But today, there are signs that the French executive is changing.**

# In France, He is an Engineer

PHILOSOPHERS, historians, statesmen, and writers have always been fascinated by the question: "Why does France behave as she does?" In the same way, businessmen are intrigued by their counterparts in the French management community. Why, they ask, is the French executive "different"?

In a recent issue of *France Actuelle*, the publication's Paris editor attempted to answer that question, and to suggest how the nature of the French manager influences the business life of the nation.

**First off,** *France Actuelle* **emphasizes the critical importance of the businessman's education.** Most top executives of French enterprises have been trained and shaped in the rigid curricula of the nation's engineering schools, and particularly of the famed Ecole Polytechnique.

Of the managing heads of France's 100 largest enterprises, at least 63 were trained as engineers. Of these 63, no less than 48 are graduates of the Ecole Polytechnique. Compare that with the situation in the U.S.A.: Very few American company heads have engineering degrees; no more than 56% of the presidents of the 500 largest American corporations (according to a 1956 *Business Week* survey) were graduated from any college. It matters little how the U.S. executive shapes his career, whether he rises through the marketing, financial, or production side of the business. Actually, 23.6% of the 500 top managers came up through marketing.

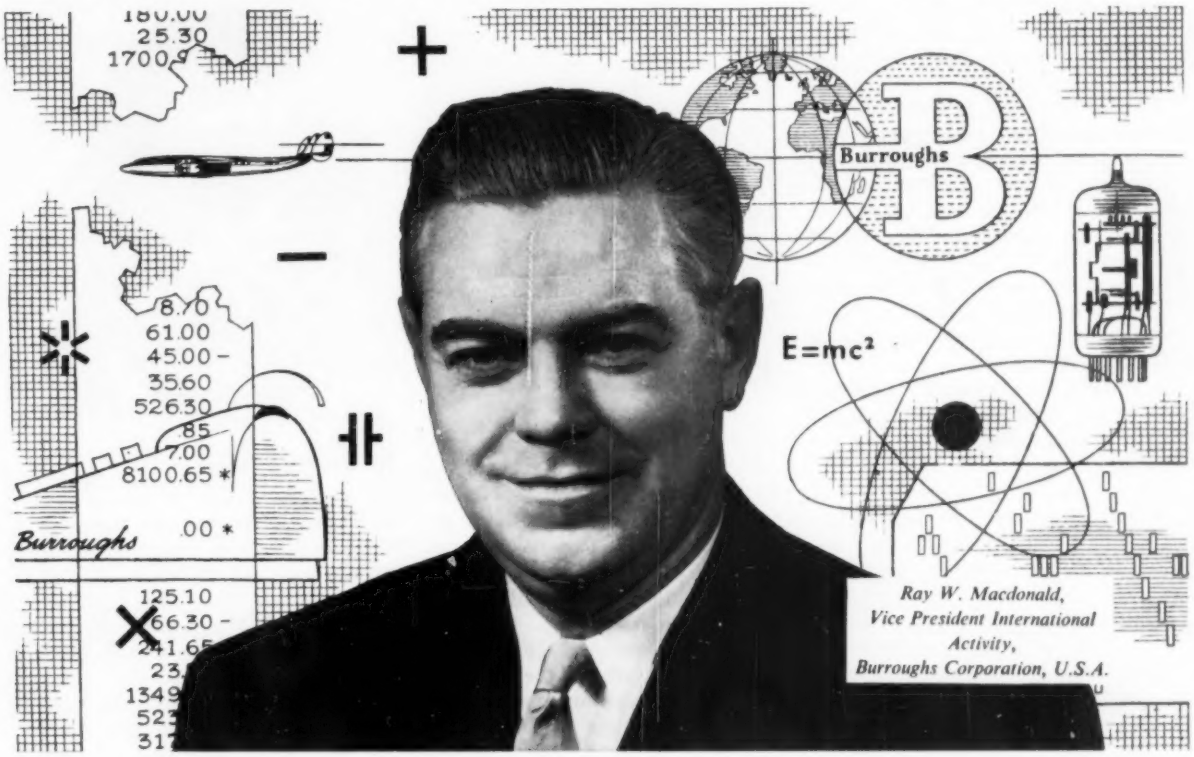
Few if any of the top managers of French industry have moved up through sales; most come through research and production.

**The "best" schools in France are engineering colleges;** the "best" families try to send their first son to the Ecole Polytechnique. Neither its attitude nor its curriculum has changed appreciably over the past century. Scientific knowledge, highly theoretical, is the basis of its education.

This helps explain why the central preoccupation of the directors of French business seems to be in manufacturing techniques, products, productivity. They are apt to spend relatively more on research and product development; their success is reflected in the many machines, products, methods created in France that are being used, and reproduced under license, around the world. Apparently the French executive's training has, in the past few years, paid off with a rapid increase in production and productivity.

But the enthusiasm of the French manager for workshop research seldom reaches into market research. There is little tendency to look ahead, plan ahead, on rising demand. French managers tend to produce only enough to meet what they conservatively estimate the market will take a few months to a few years ahead. The idea of overproduction—such as with the U.S.A.'s automobiles in 1955—strikes many a French director as "industrial anarchy."

**Rather, the Frenchman believes in stability above all.** Assured, constant production and employment




*Ray W. Macdonald, Vice President International Activity, Burroughs Corporation, U.S.A.*

# The main lever in a multi-key machine

He started out in chemistry. But chain reactions outside of his test tubes led him into another field: the trading of computing devices. He works for Burroughs. Burroughs conceives and manufactures tools to force the chaos of data and equations into orderly patterns. Burroughs makes electrons untangle in minutes the problems that human beings would take weeks to solve. Ray Macdonald is the main lever in a multi-key machine, tagged International Activity. He supervises all Burroughs operations beyond the United States and Canada. At present, a total of twenty-five countries. His memory for facts and figures matches the mechanisms of his most complex machines. And he can do what they can not. He adds the components of vision and healthy imagination to each of his decisions. He is the human being, the brain behind the electronic brain, Ray's dash and boyish face belie his gray hair. His friends, business and personal, know that they can count on him. He says no to smoking, yes to an occasional, very dry Martini. A subtle gourmand, his palate for local dishes is nourished in his role at Burroughs. Burroughs' affairs carry him away from his home and his wife, Florence, to each of the red circles on the world map in his office. When he goes on the road, he takes to the air. Very often with KLM. "For versatility and reliability," he reasons, "KLM ranks with our best achievements. And KLM has the Burroughs sense of service."

KLM
ROYAL DUTCH AIRLINES

**All over the world people of sound judgement fly KLM**

over a long period is the way to reduce business risk, waste, and loss; and it necessitates only a minimum expense for marketing.

There is little wonder, then, that the man in charge of sales in a French company is not regarded with the importance, say, of an American sales manager. The salesman is seldom envied, or accorded a voice in company policy. With few exceptions, the French do not employ enough salesmen.

Similarly, advertising budgets are low, and French firms are little interested in letting the public know what the company is doing.

**Finally, the French engineer-executive tends to recoil from the idea of a completely free and unfettered market.** He would consider "wide-open" competition of benefit to no one. French executives have preferred to reduce the degree or manner of competition which might drive the "responsible" enterprises out of business. Better, they believe, to equalize labor costs by industry-wide bargaining, to arrange joint sales efforts and market-sharing.

In brief, says *France Actuelle*, the French manager prefers to confine competition to the factory, keep it out of the market.

Many foreign observers will find in *France Actuelle's* reporting confirmation of their view that a kind of managerial *immobilisme* will continue to plague France; they predict dire problems when French industry is opened to the competitive winds of a European Market. But there are exceptions. Indeed, the situation may not be as *immobile* as it seems.

**A growing number of French businessmen are trying to make their colleagues more competitive, more market-minded.** Slowly but surely, individual firms are hiring more salesmen, taking up market research, even public relations. Most important, perhaps, is the appearance of university courses and degrees—even special schools—devoted to giving young Frenchmen more rounded training in business administration, management, marketing (MD, Feb. p13).

This trend toward management education, says *France Actuelle*, may be one of the most far-reaching contributions toward a more productive and competitive France. ●

# More Management Men at Work

## In Brazil

WALTER K. LINK often takes a box lunch to his Rio office—"It's the only quiet time in the day to think," he explains. The time is welcome, for Link has one of the most difficult, delicate, management jobs in Latin America.

A great deal is at stake. Link is chief of exploration for Petroleos Brasileiro, the government oil monopoly in a nation that each day sees more of its precious foreign exchange drained away for petroleum imports. Also at stake is whether Brazil's nationalistic approach to oil can succeed.

When Link, a 54-year-old U. S. oil geologist, was hired away from Standard Oil Co. (New Jersey), he made no attempt to conceal his lack of sympathy for government intervention in industry. He has been personally attacked in the press by ultra-nationalists. But Petrobras hired him at an excellent salary (over $100,000 net yearly) to do an exploration job. Link sticks to his exploration, avoids politics like the plague.

He regards his job as an exciting pioneer effort, and has had a free hand in organizing it. Link's department is one of the strongest in the industry; he has tried to get the best men available, anywhere in the world. While there are plenty of management difficulties—especially the politics and top-level confusion at Petrobras, to say nothing of the problem of organizing an efficient oil search over Brazil's huge land area—Link is optimistic. "If my exploration department can't find oil," he says, "nobody can."

## In Switzerland

DR. WALTER BOVERI is a manager who knows that changing direction is essential to a company whose life-blood is world trade. So the famed Swiss electrical manufacturer which he heads—Brown, Boveri & Co. Ltd.—is preparing for new ways of doing business.

The company has been exporting to the U. S. A. since the 1920s and has—in the face of severe obstacles—built up a healthy business. Now it is planning a two-step expansion, looking toward a full-scale U. S. manufacturing plant. Ten years from now, Brown, Boveri hopes to produce in the U. S. A. up to $20-million worth of goods, and sell, over-all, $40-million.

In Latin America, Brown, Boveri is in the midst of a major Brazilian project, and is studying plant possibilities in Peru and Mexico.

But it is in Europe where the biggest changes may occur. Since its founding in 1891, Brown, Boveri has set up five European subsidiary plants, manufacturing much the same products as the Swiss plant at Baden. With European economic integration looming, Dr. Boveri and his associates wonder if they must prepare for fundamental changes in their management methods, centralizing manufacture of different products. The problem may be how to square "mass production" with design-conscious Brown, Boveri's tradition of building highly-customized heavy electrical goods for buyers the world over.

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**Digested from Business Week, Sept 14, p82; Oct 5, p96.**

**FOR THE LICENSEE:** Proven products and processes are the surest way to profit and growth.

**FOR THE LICENSOR:** Selling today's knowledge returns income to develop tomorrow's product.

**FOR WORLD BUSINESS:** A potent mechanism that creates new jobs, new markets, and spreads advanced technology around the world.

# A Two-Way Street of Good Business

AT A RECENT LUNCHEON of New York's Export Managers Club, the visiting speaker set some kind of new record: Not a single one of the busy members left—as they often do—before the talk was finished. The subject: "Advantages and Disadvantages of Foreign Licensing," currently a prime topic of conversation among internationally-minded businessmen.

The practice of licensing patents, trademarks, and manufacturing "know-how" across national boundaries is not new; such agreements have been commonplace for half a century. But the practice is growing rapidly. Business journals tell an almost daily story of increased licensing activity. Two recent examples from the U. S. A.:

**The Hamilton Watch Co.** announced a 10-year technical assistance agreement with a Japanese watch company. Hamilton will supply designs and equipment; the Japanese will produce, under license, high quality timepieces.

"We have been unable to merchandise our products outside the United States," a Hamilton spokesman admitted. Now Hamilton will market the cheaper—but Hamilton designed—Japanese product in North and South America, and collect royalties on sales made by Takano Seimitsu Kogyo Co. elsewhere in the world.

**The Clark Equipment Co.** has just announced three new agreements with European firms to manufacture its complete line of torque converters. The companies will manufacture for their own accounts and will supply other European concerns manufacturing equipment under separate Clark end-product licenses.

## I. A World-Wide Network

These are just two recent examples involving the sale of American patents and technical knowledge. But, as Clark's general counsel points out, "Licensing is a two-way street of good business." Many of the most successful products in the U. S. A.—chemicals and chemical processes, certain jet engines and aircraft components, atomic equipment, and essential production machinery—are based on European knowledge. The skein stretches throughout the world, linking North and South American, European, Japanese, South African, Australasian, South Asian companies in an ever-increasing network of licenses.

Indeed, a world map of licensing agreements would resemble an up-to-date chart of world air routes.

**There must be advantages to explain such activity.** "It is just good business," emphasizes Clark's general counsel. "For the licensor it can create sales of products and parts in markets otherwise inaccessible, bring valuable technical and patent rights from abroad, and stimulate management to improve products and processes. The licensee is provided with commercially-proven designs, manufacturing processes, techniques, and patent rights that can assure success at a fair cost."

That is a good definition of the advantages of licensing. You can add many more. From the licensor's standpoint, capital is not tied up, there is no potential loss, executive talent is conserved, and all the headaches of exporting or running plants in foreign countries are avoided. Furthermore, it is a lot easier and cheaper to eventually establish a branch or subsidiary operation if licensing doesn't work out than it is to try it the other way around.

Licensing is a flexible way of

Story begins on page 19

doing business. There is no typical agreement. Generalizations are misleading; motivations vary as widely as results. About all you can say for sure is this: A licensing agreement includes precisely what the two parties agree that it should include.

## II. The Facts of Life

Why the renewed interest in licensing?

For one thing, many companies are being forced into it. The world has become smaller, but its commerce has become more complicated. Trade problems have become formidable in the face of exchange difficulties, nationalism, protectionism, and changing preferences.

Now, there is also a trend toward regionalism—talk of "common markets" in Europe, Scandinavia, Latin America. Many experts believe the European Common Market will produce a tremendous spurt in licensing agreements. Companies outside may find it more difficult for their goods to compete in the market, and many will move into Europe through licensing agreements. Within the market, competition—cutting across national boundaries as never before—will put a premium on the latest technology.

Finally, the world's fast developing technology, the higher cost of research and development, and the shortage of engineers make licensing all the more attractive to both licensee and licensor.

To be sure, direct foreign investments and trade keep on rising (MD, Nov. p15). A manufacturing subsidiary abroad still offers the closest control—and sometimes the highest profit—in foreign operations, and licensing often leads to such direct investments. Licensing also increases exports if the licensor supplies component parts.

But more and more companies have come to the conclusion that you can't count on any specific export markets at any given time in the world as it is today.

## III. Know-How for Sale

Perhaps the most important single force in the licensing movement is the growing number of management men who have come to realize they have something to sell besides goods.

"You won't find this product on your assembly lines or in your warehouses," explains a confirmed believer in licensing. "It's the know-how, the knack of doing a job, the experience that develops the blueprints. Above all, it is creative thinking."

**The basic talking point is productivity and production units, not profits as such.** You can talk this language with any manager—Communist, Socialist, or Capitalist.

In this line of thinking, the sale of "know-how" is not a passing fancy or one-time deal. To reap its full benefits, a continuous relationship is needed. In other words, a licensor must keep on having something to sell.

It follows that licensors who accept this philosophy—be they small or large companies—are leaders in research, engineering, and planning. They are concerned with tomorrow's product.

Today's technology is always obsolescent. One U.S. chemical company says it takes seven years to bring a new product to market—from "test tube to tank car." And it is an expensive business: The unforeseen is what costs.

**Companies like this one have learned that it is good business to sell "old secrets"**—or patents—in order to develop new secrets. "Make no mistake," an experienced licensor says frankly, "we scrape off the cream for ourselves. Our income from licensing is 'plus' income—just extra gravy. And as long as our licensees keep looking to us we know we are still ahead."

A common attitude these days—and a philosophy of licensing—is displayed by the licensor who says: "We will tell you everything we are doing, but nothing of what we are thinking about."

**Do licensors withhold technical information from licensees?** The simple answer is "Yes" in most cases. Many agreements restrict information to "products in or ready for commercial sale in the opinion of the giving party."

Research information is generally exchanged only between firms of equal stature. Many of today's cross-licenses are in this category; and already there are prospering "families" of license-affiliated companies that have developed a worldwide laboratory of research and development.

**Do licensees get their money's worth?** Again the answer, and it has real meaning, seems to be "Yes." They get tried and proven know-how, trouble-free processes, and products with a proven market. And, by and large, they get all the information they can use. One economist who has pondered the question says flatly that licensees get more than their money's worth—it's practically impossible for licensors to measure the value of a piece of information.

## IV. Finding a Partner

For both parties, the principle is the same: Find the "best horse in the field to ride."

An engineering firm with a small family of licensees decided to extend its operations to a certain Asian country. On investigation, the company quickly came to the conclusion there were only two men in the country capable of doing the job. One wasn't interested in the offer, the other was; and a license was soon negotiated.

**Such licensors are looking for the proven skill in organization and management.** They prefer someone in generally the same line of business. The ability to raise capital is often a prerequisite, but the ability to build an organization is the most sought-after commodity in the world. Companies without licensing experience sometimes overlook this simple maxim.

A well-known Latin American management man set out to enter a small machinery field. The leaders in this machinery line were well known. First, he approached the U.S. company whose product was a household word around the world. The Americans were interested, but the negotiations never reached the contract stage. According to the Latin American, the attitude of the U.S. firm was too inflexible.

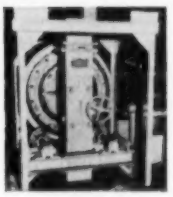
So he went to Germany. There,

# HIGHLY INTIMATE BLENDS IN 1 TO 2 MINUTES

## Sturtevant blending continues during discharge - no segregation or flotation

Sturtevant's unique 4-way blending action begins during charging phase — continues during discharge phase. Thus highly intimate blends often are produced within 1 to 2 minutes. A *complete* blending cycle — from start of charging to completion of discharge — may be accomplished within 3 to 5 minutes.

Sturtevant's special action produces no particle reduction, cleavage or attritional heat — is highly effective yet gentle and safe even with explosives.



10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.

One of four 450 cu. ft. Sturtevant Blenders at Celriver Plant of Celanese Corp. (Rock Hill, N.C.). These large units handle up to 20,000 lbs. batches — have a 9-year record of meeting the most exacting blending requirements.

### Self-cleaning, dust-sealed drum; fast, one-man accessibility

Operation of Sturtevant Blenders is completely dust-sealed; special design of stuffing box fully seals against leakage. For inspection of all models, one man simply loosens a few lugs to remove manhole cover — quickly and easily.

**Receiving**

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way — circular, vertical and two lateral.

**Discharging**

Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

### Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs — can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (See coupon for available bulletins on other Sturtevant machinery.) Write today.

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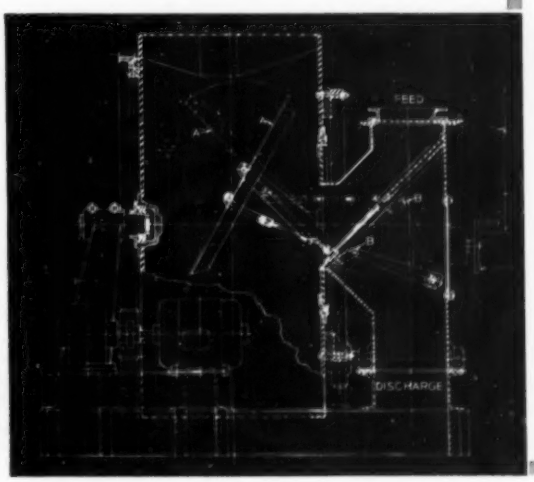
**Pilot plant blending to largest production runs are handled by standard models of Sturtevant Blenders with capacities from 10 cu. ft. to 900 cu. ft. Rotary drum design is a proven spacesaver, including headroom. Write for Bulletin No. 080B giving complete specifications.**




**Sectional view of Sturtevant Blender**

***'A' (solid line) shows swinging chute in blending position; 'B' (solid line) shows gate closed for blending. 'A' (dotted line) shows swinging chute in discharging position; 'B' (dotted line) shows gate open for discharging.***

My dry-process materials are: _____

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Firm _____

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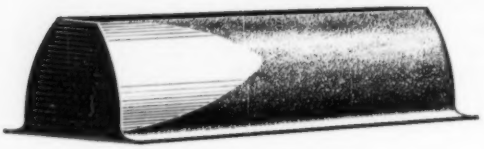
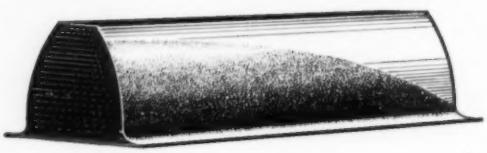
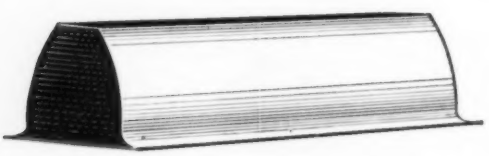




## CORRECTION OF HEAT-TREAT DISTORTIONS

Minor distortions in tooth profile, helix, index and runout are corrected in from 15 to 60 seconds of honing time.



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Story begins on page 19

he found what he wanted—a flexible attitude backed by an aggressive development program. "Interestingly," he now reports, "the German firm is giving the Americans stiff competition in their own country."

Some licensors solicit licensees, others do not. Many licensees start out as distributors or service representatives. However the partners get together, the heart of success in licensing is this: Both sides must be satisfied with the arrangement, and both parties must profit.

Negotiating a license is not an overnight affair. According to one negotiator, it usually takes six months to two years from "contact to contract." Few negotiations get down to serious business until the parties feel they know each other. This means there is usually a period of visiting—partly social (one experienced negotiator takes his wife along to help out during this period) and partly formal exchanges of management viewpoints.

Sooner or later, the discussion gets down to "brass tacks." Many negotiators start by drawing up a hypothetical balance sheet and profit and loss statement for the prospective enterprise or product line involved in the license.

A cost survey is a good first step—plant and operating costs, land, buildings, equipment, labor, inventories, and working capital. Of these, working capital is the most critical. Most licensors will want to check a prospect's financial data for solvency, soundness, and investment return. Accountants are frequently called in.

## V. The Contract

Safeguards required by both sides are now well known. A lawyer experienced in licensing should be able to produce a variety of sample contracts, as well as advice. Several companies with commanding positions in their industry and long experience in licensing have worked out standard contract forms. A licensee takes it—or leaves it.

**The first ingredient of a good contract is sincerity and mutual respect.** In most cases, the licensor negotiates from a position of strength; and the licensee must begin with a certain amount of faith in his integrity. But to create a good licensing contract, managers must be good negotiators, and a good negotiator is understanding, diplomatic, discerning—and sometimes tough. Most negotiations are hammered out by the classical technique of starting high (or low) and bargaining toward a cross-over point.

Business ethics and customs vary around the world, and whether you are licensee or licensor, it is a good idea to find a countryman with experience or knowledge of your opposite number at the bargaining table.

The future of the negotiation—and of the license itself—may be determined by this knowledge. Some businessmen, for instance, commit themselves only to the "letter" of the contract. If so, it is wise to try to make the "letter" reflect the "spirit."

## VI. Payments and Royalties

Usually an initial payment by the licensee is required for the execution of the contract.

The amount usually depends on the services necessary to "vitalize" the enterprise. It may vary from a token payment of good faith to substantial payments for services rendered—architectural and purchasing assistance, a complete layout of the plant, specifications for equipment and materials, the training of key personnel.

**There can be special reasons for caution.** In some countries, a government agency reviews all commitments to foreign exchange payments before they become final, and sometimes the government asks for a renegotiation. (Generally, each party handles all problems with its own government.)

Royalties are often set by the li-

## What to Look for in a Licensing Contract

Licensing contracts are legal documents and usually involve many "whereas" clauses and other legal language. But from the businessman's viewpoint, most contracts cover these 12 points:

1. Definition of subject matter—careful and specific identification of products, standards, trademarks and patents, terms and conditions of use by the licensee, the scope and nature of technical assistance offered.
2. Territory in which the right to manufacture and sell is granted, and whether such right is exclusive or non-exclusive.
3. Compensation to be paid, how paid, in what currency, and where.
4. Right to grant sub-licenses, if any.
5. Right of licensor to improvements made by licensee—in patents, processes and "know-how."
6. Length of license and conditions under which it can be terminated.
7. Right of assignment, if any.
8. Conditions under which technicians and engineers are to be sent to assist licensee.
9. Right to visit licensee's plant facilities, and to inspect accounts and records.
10. Right of licensee's personnel to visit and train in licensor's plant.
11. Maintenance of production standards.
12. Disposition of technical data upon termination of agreement.

Story begins on page 19

censee's first "arms-length" transaction or sale. They can be based on anything that best fits the product—gross sales, selling price, weight, volume, power. The royalty rate often decreases as production increases.

There are probably more royalty agreements at 5% on gross sales or selling price than any other rate; 5% seems to be the mode, if not the median. But the average means little when you are negotiating a contract. The royalty depends on the nature of the product and the industry, the amount and expense of development work, and the demand for the product.

**One of the chief worries of licensors is that the licensee will "sit on the market"**—to wait for patents to expire, or for other reasons of his own. More often than not, there is a minimum royalty payment, regardless of sales or production. Some careful market research before the agreement is signed can save a lot of trouble.

"Best effort" clauses often specify the minimum advertising and sales promotion, as well as production quantities, that a licensee must undertake. And "cause for default" is often specifically defined.

For new relationships, a short term—usually five years or under—is favored. If the relationship prospers, the term is not very important. Most contracts are reviewed at intervals anyway.

There is sometimes a fixed monthly payment over and above royalty payments. One small engineering firm bases this fee on the salary of a good researcher. But usually the royalty includes a pro-rata cost of continued research.

## VII. Closer Relationships

There is a trend in international licensing toward a combination of royalty payments and equity participation. Many licensors see the opportunity to share in the tremendous growth potential of the licensee's market; many of today's licensees may be tomorrow's industrial giants.

With a direct investment in the licensee's company, the licensor will continue to profit even if the agreement is terminated. The percentage of stock participation varies—from 5% to 20% or more—usually inversely to the royalty rate. Generally, the licensor puts one director on the licensee's Board; thus he has a voice in company policy and a better chance that the relationship will continue.

Others invest simply as a token of faith in the licensee. Some state their interest bluntly: Licensees tend to take advice more readily if the licensor backs it with an investment.

**If practical, most manufacturers prefer to license their trademark** along with product "know-how." This makes for a close relationship. But a trademark can be lost if the licensee makes an inferior product, and the proprietor cannot afford to take chances: That small word or mark represents an enormous investment.

Trademark agreements specify quality standards, and the licensor usually demands wide police powers, and the right to revoke the license if he thinks the trademark is in jeopardy.

## VIII. License Management

Most large corporations have an experienced staff to negotiate and administer their license programs, which may run to 90 or 100 working agreements.

Smaller firms—and many more are showing up in the ranks of licensors—often find it more difficult. One U.S. company, after developing a small family of licensees in Europe on the basis of patents for a welding process, decided that patent administration and foreign exchange problems were taking too much time and energy. So it sold the patent rights to one licensee for a fixed sum—based on a projection of the royalty fees—and this licensee became the licensor by renegotiating the other agreements.

**It is common practice to put some sort of limitations—territorial or other—on licensees.** A few American licensors, feeling the restraint of U.S. antitrust laws, complain that European competitors use licensing agreements "to carve up the world's markets." By and large, though, objective observers say that contract limitations usually reflect natural limitations—the ability of the licensee and normal marketing boundaries.

Licensors, doing business in countries with differing laws, court procedures, and attitudes toward foreign companies, prefer to arbitrate their disputes. Contracts usually specify the arbitration rules—such as those of the International Chamber of Commerce or the American Arbitration Association.

## IX. The Impact of Licensing

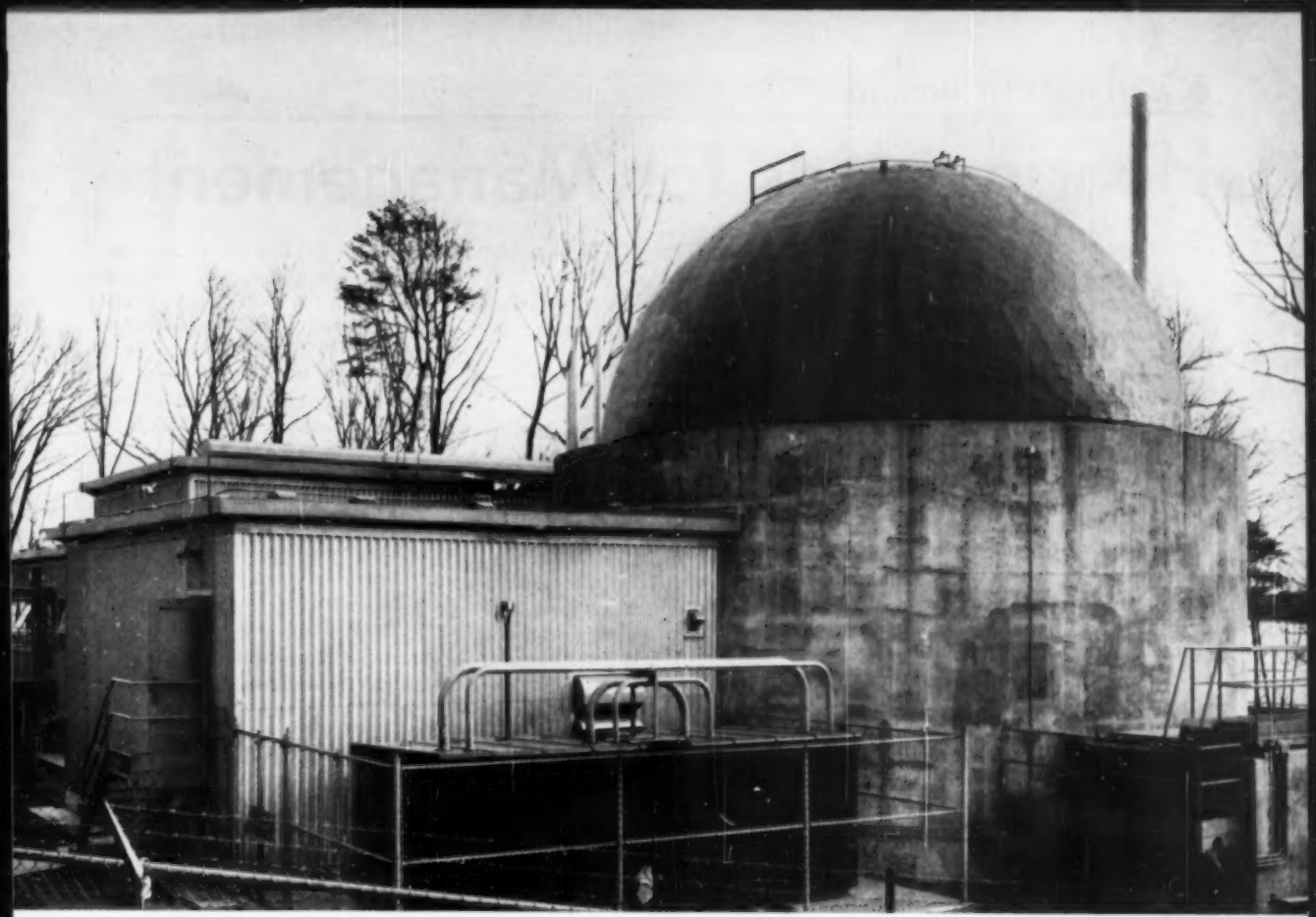
Despite the increased interest in licensing, businessmen have discovered there are few hard facts and figures on the subject available to guide them.

Economic researchers in the U.S.A. are currently busy with studies and interviews. Their first target will be the extent of licensing by U.S. companies, then they will get into a broader world survey. New information on licensing activity—which MANAGEMENT DIGEST will report as it becomes available—should make interesting reading.

**But there is no easy way to calculate the impact of licensing.** Much of the return is intangible—the incalculable value of larger markets, and new technical knowledge spread around the world.

One American specialist, admittedly making an "educated guess," estimates that U.S. companies alone are earning $550-million a year from overseas royalties, and that excludes the value of reciprocal patents and "know-how" coming from their licensees. "Capitalizing" this return at the average 5% royalty rate, this researcher guesses that U.S. licenses abroad are worth a minimum of $10,000-million.

**Add to that the value of licenses American firms have from overseas,** plus the myriad other license agreements linking companies elsewhere in the world, and you have one of the most potent and profitable mechanisms in world business today. ●



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# Hearing Aids for Management

**Listening is an essential skill. Good listeners grasp for ideas, control "spare thinking time."**

Digested from HARVARD BUSINESS REVIEW, Sept-Oct, p85

*Most people do not know how to listen.*

*Management is beginning to wake up to this fact. Many business schools now offer courses in "How to Listen," and companies are holding executive seminars to discuss the subject. Following one such session, a top manufacturing executive summed up his reaction:*

*"Frankly, I had never thought of listening as an important subject by itself. But now that I am aware of it, I think that perhaps 80% of my work depends on my listening to someone, or to someone listening to me."*

*Basically, the problem is that we think much faster than we talk—we have "spare time" for thinking while we listen.*

**Taking side-roads into private thoughts is a strong aural habit with most people.** Sooner or later, the listener stays away too long; and once he has missed part of the message, these mental sidetracks become more inviting than ever. He misses more and more of what the speaker has to say.

A good listener knows how to use his spare thinking time efficiently. He directs his thoughts to the message through four means.

—Thinking ahead of the talker, trying to anticipate where the discourse is leading and what conclusions will be drawn from the words.

—Weighing the evidence used by the talker to support the points that he makes. "Is this evidence valid?" "Is it complete evidence?"

—Periodically reviewing and mentally summarizing the talk.

—Listening "between the lines," searching for meaning that is not necessarily put into spoken words, paying attention to facial expressions, gestures, tone of voice. He asks himself, "Is the talker purposely skirting some area of the subject? Why?"

**The good listener concentrates on grasping ideas.** For some reason, many people say with pride that they try to "get the facts" when they listen; some even try to memorize every single fact that is spoken. This is a bad listening habit. Grasping an idea helps the listener to remember the facts.

**Listening ability is affected by the emotions—which act as filters of what we hear.** When a listener hears something that goes against his prejudices or convictions, the normal tendency is to begin planning a rebuttal and formulating questions to embarrass the talker, or perhaps just turning to thoughts that support his own feelings on the subject. And when he hears supporting talk, he drops his critical faculties.

There is no easy way to reserve judgment until the talker has finished. It takes persistent practice.

**Searching for evidence to prove yourself wrong is not an easy task either,** but it is an important part of listening. The listener who is receptive to positive and negative evidence is much more likely to hear all that is being said.

Listening skill can have important results in a business. There is less need to commit everything to writing—memos, filing cabinets, and misunderstandings are reduced. Upward communications are greatly improved.

**But most important, listening is a critical ingredient in human relations.** Too many superiors fail to listen to their subordinates. And their subordinates, if they do not feel free to say what they want to say, fail to bring up problems that should be aired. Such problems can turn into unrealistic monsters that come back to plague the man who failed to listen. ●

# Group Decisions On the Rise

Digested from ELECTRONICS, Oct10, p23; MANAGEMENT REVIEW, Oct, p4

Listen for a moment to William T. Gossett, vice president of the Ford Motor Co.:

"The modern management system is marked by cooperative effort, rather than the brilliance of individuals. For a number of sound reasons, the typical large corporation is run by committees. No individual judgment is likely to be consistently superior to the aggregate judgment of seasoned professional groups."

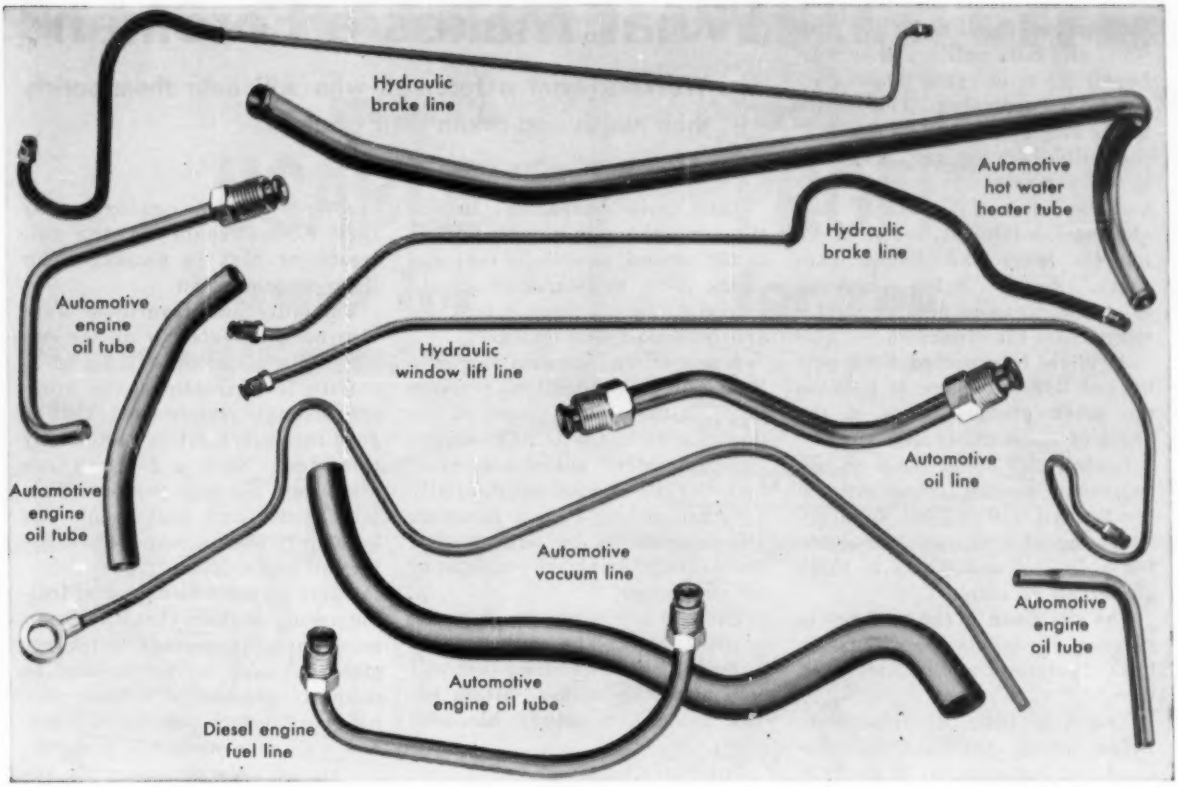
**Not all managers will agree unqualifiedly with Gossett's praise of the committee.** Indeed, some businessmen—and not a few philosophers—in America are coming to believe that entirely too much stress is laid on "group-think," not enough on individual "brilliance" and responsibility. Certainly the committee system is not suited to all enterprises.

Yet the increased power of the committee is borne out by recent studies of the American Management Assn. There are more committees—in large and small companies—than existed five years ago; and the AMA points out that they carry more authority.

**The committee system is a logical outgrowth of management's concern** with cooperative effort and improved communication. And some companies have carried it to the point of a formally-defined philosophy—such as "Group Approach Management" (GAM).

One small electronics company, the U.S.A.'s Miniature Precision Bearings, attributes its success (it has expanded tenfold in seven years) to GAM. This electronics concern uses GAM in every way possible—to review policies, plan operations, discuss service needs.

According to this convert to the committee, GAM works only if

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—Listening "between the lines," searching for meaning that is not necessarily put into spoken words, paying attention to facial expressions, gestures, tone of voice. He asks himself, "Is the talker purposely skirting some area of the subject? Why?"

**The good listener concentrates on grasping ideas.** For some reason, many people say with pride that they try to "get the facts" when they listen; some even try to memorize every single fact that is spoken. This is a bad listening habit. Grasping an idea helps the listener to remember the facts.

**Listening ability is affected by the emotions—which act as filters of what we hear.** When a listener hears something that goes against his prejudices or convictions, the normal tendency is to begin planning a rebuttal and formulating questions to embarrass the talker, or perhaps just turning to thoughts that support his own feelings on the subject. And when he hears supporting talk, he drops his critical faculties.

There is no easy way to reserve judgment until the talker has finished. It takes persistent practice.

**Searching for evidence to prove yourself wrong is not an easy task either,** but it is an important part of listening. The listener who is receptive to positive and negative evidence is much more likely to hear all that is being said.

Listening skill can have important results in a business. There is less need to commit everything to writing—memos, filing cabinets, and misunderstandings are reduced. Upward communications are greatly improved.

**But most important, listening is a critical ingredient in human relations.** Too many superiors fail to listen to their subordinates. And their subordinates, if they do not feel free to say what they want to say, fail to bring up problems that should be aired. Such problems can turn into unrealistic monsters that come back to plague the man who failed to listen. ●

# Group Decisions On the Rise

Digested from ELECTRONICS, Oct10, p23; MANAGEMENT REVIEW, Oct, p4

Listen for a moment to William T. Gossett, vice president of the Ford Motor Co.:

"The modern management system is marked by cooperative effort, rather than the brilliance of individuals. For a number of sound reasons, the typical large corporation is run by committees. No individual judgment is likely to be consistently superior to the aggregate judgment of seasoned professional groups."

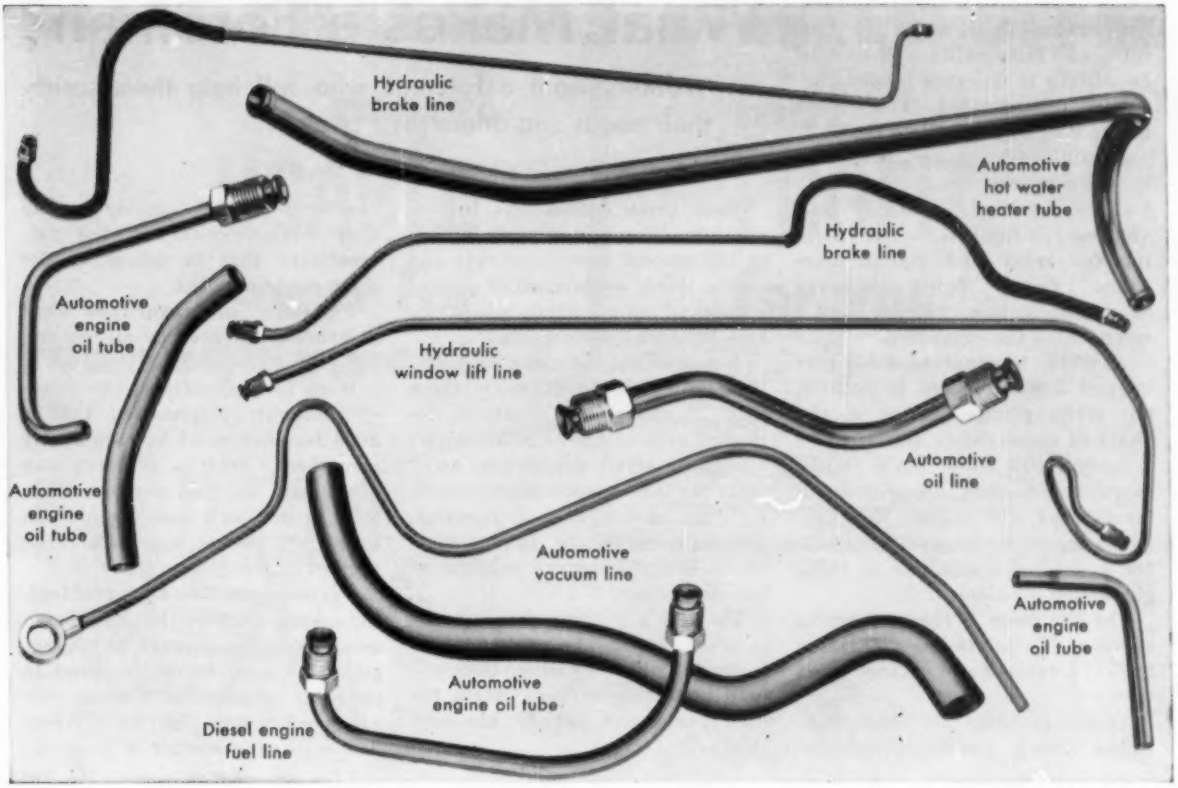
**Not all managers will agree unqualifiedly with Gossett's praise of the committee.** Indeed, some businessmen—and not a few philosophers—in America are coming to believe that entirely too much stress is laid on "group-think," not enough on individual "brilliance" and responsibility. Certainly the committee system is not suited to all enterprises.

Yet the increased power of the committee is borne out by recent studies of the American Management Assn. There are more committees—in large and small companies—than existed five years ago; and the AMA points out that they carry more authority.

**The committee system is a logical outgrowth of management's concern** with cooperative effort and improved communication. And some companies have carried it to the point of a formally-defined philosophy—such as "Group Approach Management" (GAM).

One small electronics company, the U.S.A.'s Miniature Precision Bearings, attributes its success (it has expanded tenfold in seven years) to GAM. This electronics concern uses GAM in every way possible—to review policies, plan operations, discuss service needs.

According to this convert to the committee, GAM works only if

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| High bursting point | Takes plating |
| High endurance limit | Shock-resistant |
| Extra-strong | No inside bead |
| Ductile | Uniform I.D., O.D. |

there is the proper climate for it; the company head must like flexibility and informality, and he must be willing to delegate responsibility to subordinates. The people under him, too, must like GAM.

Possible advantages, according to this company, are speedy action and communications, higher morale and job interest, better training for lower and middle managers, fewer fights between departments, more balance, and a strong base for expansion.

**As might be expected, GAM gets bogged down if there is politics, too much discussion,** or if the chain of command is bypassed.

Each group under GAM should represent various organizational levels and specialties. Management should never underestimate the ability of specialists to think out broad problems.

**The chairman is the real key to success.** He points the discussion toward solutions and decides when to act.

There is little difference between Group Approach Management and management by committee, except as a formally-defined philosophy. Committees, as the chart below shows, are being used more than ever before. It should be noted, however, that committee decisions are sometimes determined by the preformed opinion of a strong chairman. Such a situation indicates that, although the system is used, the philosophy is not wholly accepted.

# What Makes a Foreman?

## Workers want a foreman who will help them satisfy their needs and attain their goals

Digested from SUPERVISORY MANAGEMENT, Oct, p2

Take three companies: In one the atmosphere is notably strict; in the second, amazingly lax; and in the third, well-balanced. Could a good foreman switch companies and be equally successful?

A new study indicates he could. Hourly-paid production workers (110) in three such plants in the Boston area of the U. S. A.—interviewed in strict confidence, away from the job—agreed substantially on what makes a good foreman. There seem to be fundamental traits every employee expects of his supervisor.

There is a common denominator in these traits: The worker wants foremen to have qualities that will help him—the worker—attain his own goals and satisfy his own needs.

These traits are not new discoveries, but this study emphasizes that they are fundamental.

**The first trait is personal consideration.** Employees want to be treated with respect for their individuality, dignity, and feelings.

Another fundamental expectation: A foreman should be impartial and play no favorites. Unless a foreman is completely honest and trustworthy, employees say they cannot count on the fair treatment that is necessary for their peace of mind.

**Partiality and favoritism were vigorously resented by all the employees interviewed.**

With few exceptions, the workers strongly emphasized that a good foreman must be technically competent. Such a foreman can often help his men perform their jobs better; and most people can look up to such a man with satisfaction and respect.

**There seems to be a general feeling among workers that a foreman must have the courage** to correct men who need correcting, and to maintain reasonable control over his work group. He must know how well each worker is performing his job. Workers want the appreciation that goes with a good job performance—and they don't want the temptation of being able to "get away" with poor work.

Most employees appreciate a foreman who is straightforward and decisive. They want him to say when he is dissatisfied—though tactfully—and to carry out decisions when something must be done.

**Most workers are definitely opposed to extensive social "mixing"** between foreman and employee. The reason: Workers feel insecure if they think they have to compete socially for the boss's favor. Most workers want to be recognized for job performance, not for personal friendship with the foreman.

Areas of greatest disagreement among the workers involved the discussion of personal affairs and the amount of supervision desired.

According to this survey, it would be wise for a foreman to discuss personal affairs only if the worker wishes to. And as a general rule, he should supervise all employees to the minimum extent necessary for adequate control and information, regardless of individual preferences, and give extra supervision on an individual basis.

## Where Committees Make Policies

Individuals may still play the major role in decision-making, but note how many critical decisions are made by committees today. This new survey by the American Management Assn. covered 74 U. S. companies; the figures do not always add up because not all respondents answered each choice, and some checked more than one. That shows that while it is rising, the use of committees is still a flexible matter to many management men.

| DECISION AREAS | KEY DECISIONS MADE BY | | |
|---|---|---|---|
| | Individual Executive | Board | Other Committee |
| Pricing policy | 40 | 15 | 20 |
| New products | 21 | 19 | 42 |
| Advertising and promotion plans | 46 | 11 | 22 |
| Long-range planning | 20 | 33 | 24 |
| Major capital investment | 21 | 45 | 16 |
| Production volume | 39 | 9 | 26 |
| Personnel policy | 43 | 9 | 27 |
| Hiring executives | 54 | 13 | 10 |

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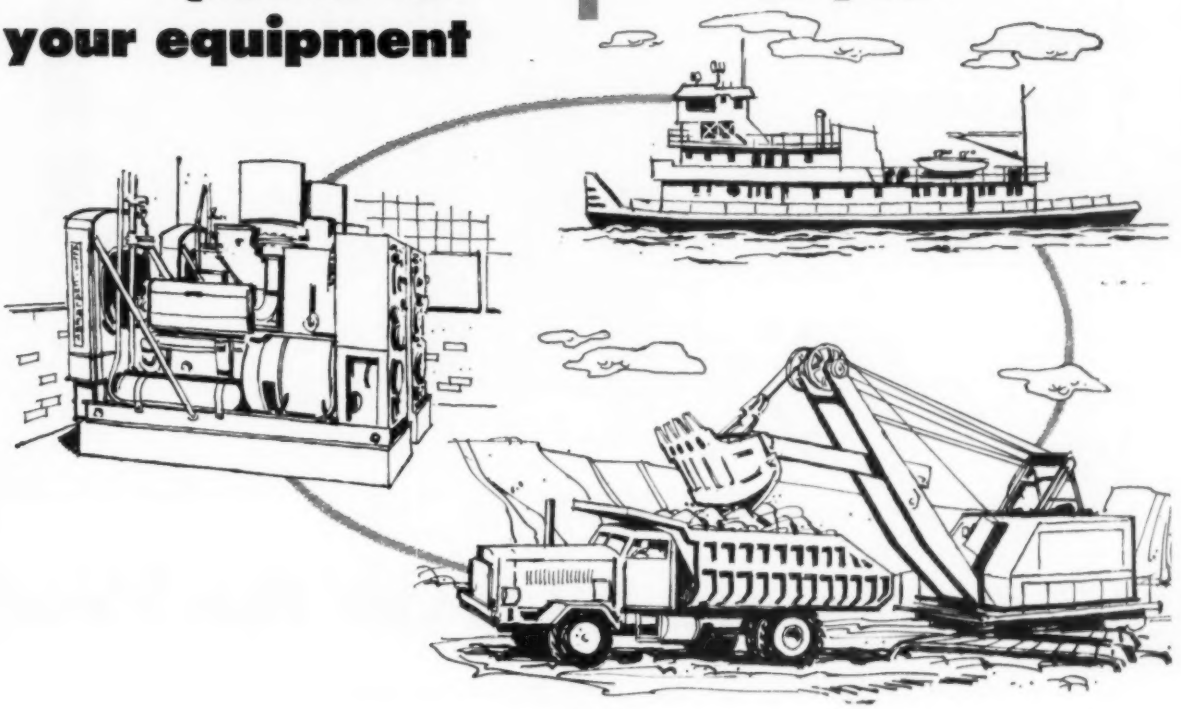

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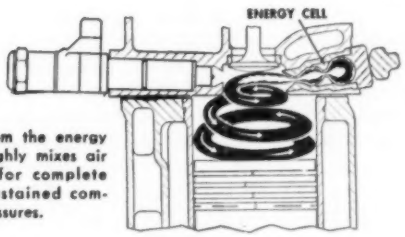


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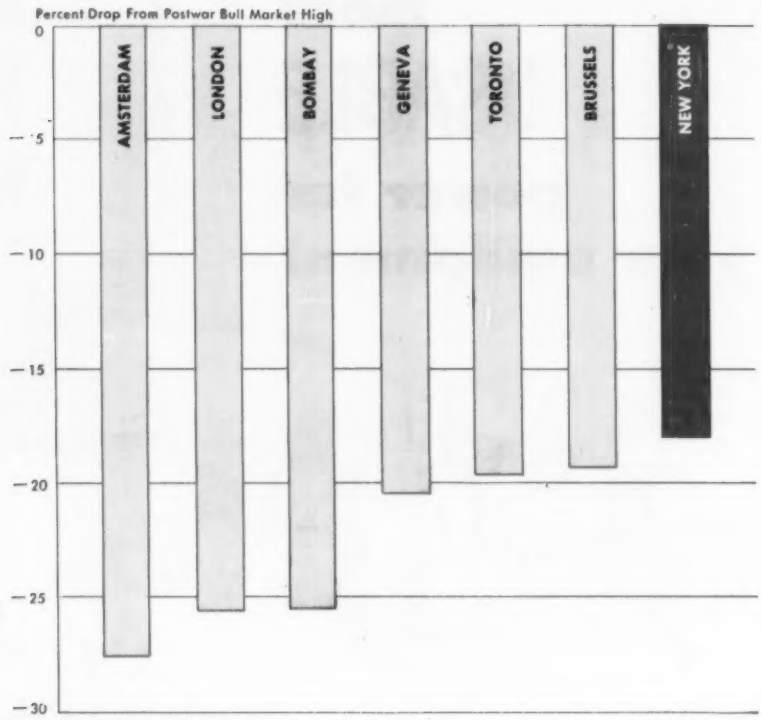
**IN THESE OVERSEAS MARKETS THE DECLINES HAVE BEEN DEEPER THAN IN NEW YORK . . .**




*Data: Standard & Poor's Daily Industrial Stock Price Indexes And Representative Local Industrial Stock Indexes.*

# Investors All Over the World

**The business outlook, Wall Street, currency problems, sputnik and rocket-rattling have depressed the stock markets throughout the world.**

The aches and pains of the stock market seemed as wide-spread as Asian influenza when MANAGEMENT DIGEST went to press. And while stock prices, like flu viruses, are unpredictable, it was clear that the world's investors were worried.

In fact, the charts show that most stock markets have been hit harder than New York's Wall Street. This has not been the first time foreign markets have been more extreme in their reaction. Through much of the past few years' upswing, traders in foreign markets have harvested much richer profits than have Wall Street operators.

**Now, unfortunately, the converse is true.** In Amsterdam, Bombay, London, Geneva, Toronto, Brussels, representative industrial shares have dropped further than those in New York.

Clearly, each stock market reacts to local problems. But the recent break in Wall Street has been a very important factor everywhere; so has *sputnik*, Comrade Khrushchev's rocket-rattling, Middle East trouble. And, possibly most important, there is the uneasy feeling that the end may be near for five years of boom.

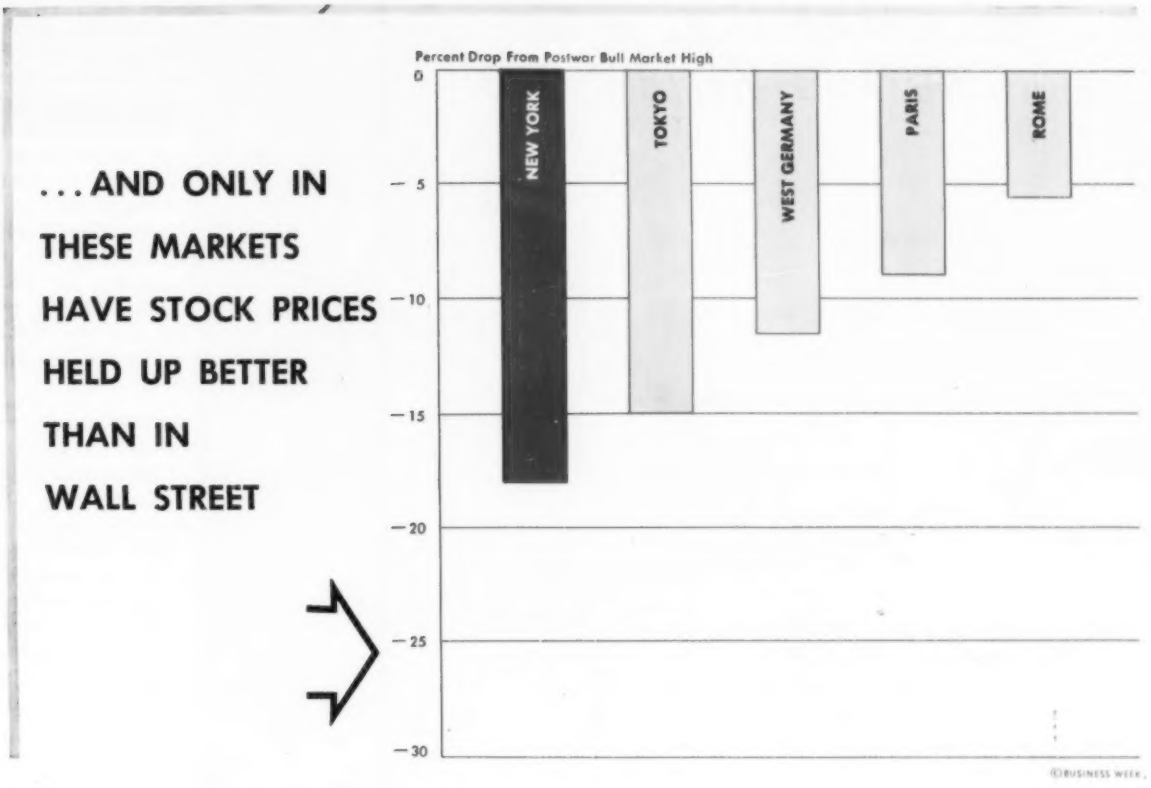
**Whether the boom in world industrial output and trade is really ending** is a moot point. Opinion is divided. Some economists still see inflation as the prime threat. Others feel that anti-inflation policies have finally been pushed too far in some nations. They are particularly distressed by the drop in commodity prices.

The worriers have noted some levelling, even drops, in critical segments of the American economy. There will be real trouble, they add, if the trends develop into a major recession in U. S. business activity: This time, a U. S. "sneeze" might cause "pneumonia" overseas.

Here is how some world stock exchanges are reacting:

**LONDON**—Daily trading has been depressed, unsettling. What pauses there have been in the downward movement have been due more to the caution than the optimism of investors. Most advisors counsel a "wait-and-see" attitude.

August and September, of course,




# Get That Worried Feeling

saw stock prices disturbed by the pressure on the pound sterling. Even after sterling firmed, investors remained uneasy. They saw some alarming possibilities in the government's determination to defend the pound: labor trouble, for example, and lower profit margins and dividends.

And, too, British brokers stress the influence of Wall Street. This was evident when Wall Street's reaction to *sputnik* and the Middle East excitement ended a short period of stock market optimism.

Yet Londoners are hopeful. They suspect that the world's actual and potential business difficulties would evaporate if the U. S. economy picked up speed. And they are confident the upturn will come. The U. S. A., they believe, is facing no more than a "shallow decline" which could easily be offset by easier money and more government defense spending.

**AMSTERDAM** — Netherlanders blame stock weakness on these factors:

—Higher interest rates; cuts in government spending.

—Wall Street's behavior; world political tension.

—The approach of a huge capital stock offering by Royal Dutch Shell (Holland's share will be about 300-million guilders).

—Less favorable reports by important Dutch industries.

Nonetheless, most Dutch analysts believe stock prices will stay about where they are—barring world political catastrophe.

**BRUSSELS**—Belgian brokers say that stock prices first became unsettled in 1956. Fear of an international recession came first, then the slump in copper prices and other Congo materials, later an awareness that industry's deliveries were creeping ahead of new orders.

The biggest blow of all was the news that the government's overdraft at the Belgian central bank had passed the 10,000-million franc statutory limit. This, traders believed, would bring strict deflationary measures, cancel tax cuts. Though business activity is still high, investors are worried about new wage demands and lower corporate profits.

**FRANKFURT**—Stock brokers are not alarmed by the modest price decline so far, which they blame on foreign selling. Germans, they add, are presently holding on to their shares.

Last summer's boom in German stocks was due in large part to foreign buying, stimulated by rumors of a revaluation of the Deutschemark. The boom has since disappeared (indeed, there has been a marked flow of speculative funds away from Germany);

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but brokers think it will resume as domestic German buying rises.

**GENEVA**—Swiss bankers blame the steep stock decline on the same factors mentioned elsewhere. They add that things would not be so bad if traders had not bid up many stocks to "fantastic" price levels.

You will find few optimists among Swiss students of the markets. Apart from international worries, they say that many Swiss industries have expanded too fast, without enough attention to potential sales. They also cite "overuse" of credit, over-full employment, wage-inflation.

**PARIS**—"Bull market" highs on the Bourse were set in August, under pressure of inflation and new oil discoveries. Since then, the government's economic troubles, Algeria, Wall Street, and doubts about the durability of industrial expansion have caused disquiet.

But all the worries have not yet added up to a drastic sell-off on the market. Brokers are advising investors to "hold steady."

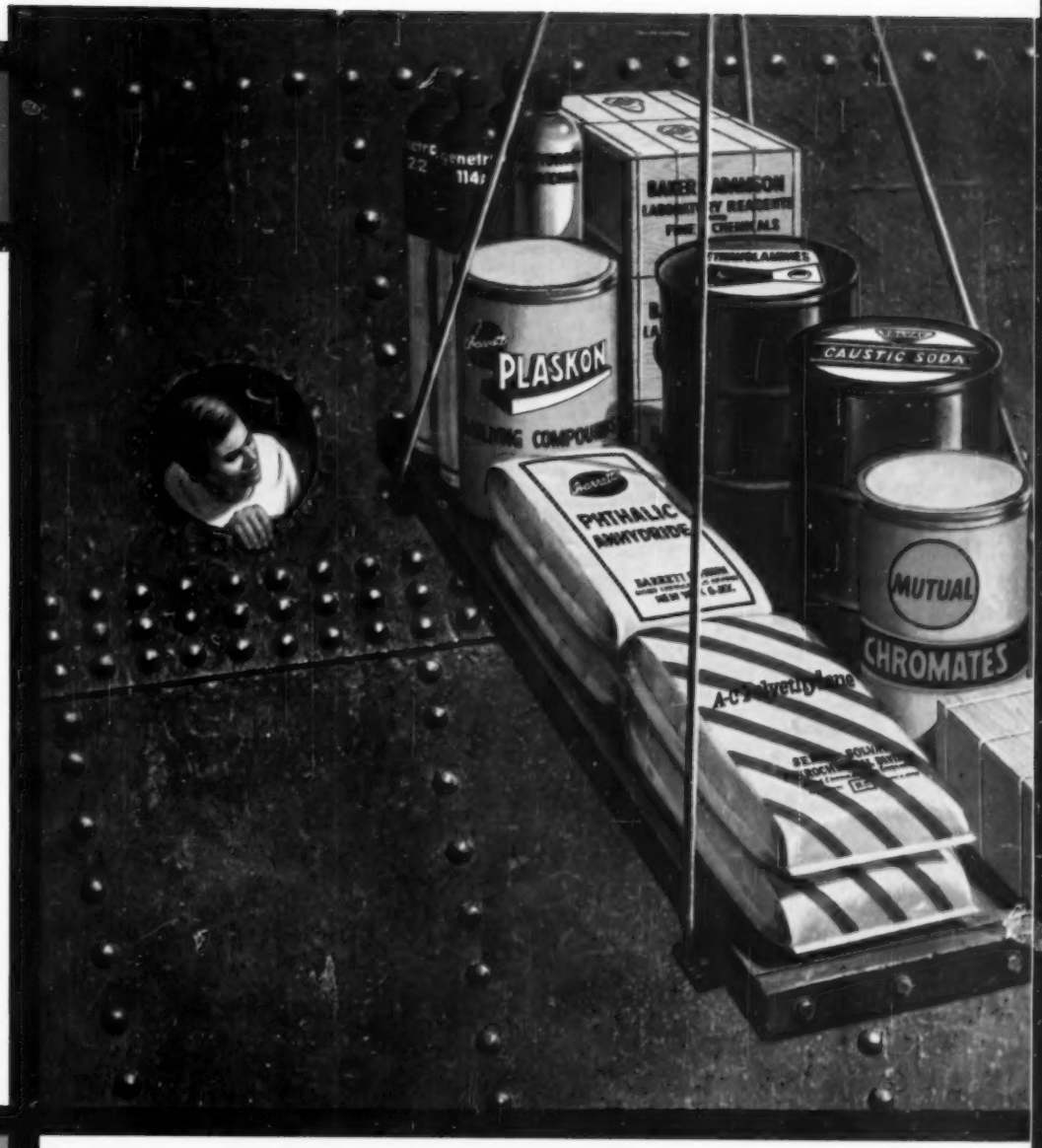
**BOMBAY**—The heavy taxes announced last May started the steep decline in the Indian stock markets. Further pressure came as foreign exchange reserves drained away, and the government admitted it would have to cut back the Five Year Plan. Other factors—such as heavy inventory build-up in the important textile industry— contributed to price weakness.

Financial observers say prices would be even lower now had it not been for news of U. S. loans to expand the steel and rayon industries, yen and Deutschemark credits, and settling of several U. S.-Indian deferred payments arrangements.

**TOKYO**—Stock prices began to fall on the Tokyo exchange last May, when the government raised the discount rate in an effort to curb imports. The drop has slowed since; there have been upward rallies following good crop news, and steady improvement in the international payments position.

Traders now think the government may ease credit slightly, and cut the corporate tax rate. And they are not worried about stock prices—though they admit last May's peak is not likely to be matched for some time. ●

Allied Chemical

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**For the PAINT INDUSTRY:**

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**NATIONAL ANILINE:** Dyes, certified food colors, intermediates; "CAPROLAN"—the new concept in nylon—and "NACCONATE" isocyanates for urethane foams.

**NITROGEN:** One of the world's foremost producers of nitrogen products, including ammonia, urea, sodium nitrate and "ARCADIAN" fertilizers as well as petrochemicals, such as ethylene glycol, ethanolamines and methanol.

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**ALLIED CHEMICAL INTERNATIONAL:** Sells and services all of these products to overseas customers throughout the world.

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# ▶ FINANCIAL DIGEST

**Common share offerings have been "few and far between" since the stock market break in mid-July,** a New York investment banker recently told *The Wall Street Journal*. There are a few exceptions such as the huge new issues of Standard Oil of New Jersey and Royal Dutch Shell (note that these stocks dropped in price on the announcement) but most companies cannot afford the extra cost of selling shares in an uncertain market.

In times of uncertainty, investment bankers—who actually buy the issues for resale to the public—demand a higher discount. The selling price is lower of course.

The *Journal* cites a typical case: In 1955—in a rising market—a U.S. utility placed a new issue of common shares at a bare .008% below the market price of its stock. This fall the same company could get no better than a 6% discount for a comparable issue.

That puts all the more strain on the bond market—and companies are trying to lure bond buyers with rights to convert the debentures to common shares or to buy common shares at a set price. Other companies are simply postponing plans to raise capital.

Another effect of the "bearish" stock market: Stock option plans—a favorite way to increase top executive compensation in recent years—look less appealing.

**But aside from immediate effects, Wall Street analysts are looking for a deeper meaning to the behavior of the market.** True, they say, the market has been subjected to complicated and contradictory forces. Beyond that, however, is a basic and perplexing question: Which should yield more—stocks or bonds?

Theoretically, in what a *New York Times* financial expert calls a "balanced capitalist economy," common-share equities should yield a higher return than bonds. Equity buyers expect a higher return to compensate for the risk inherent in common shares; bond buyers accept a lower return for the assurance of a safe investment and steady income.

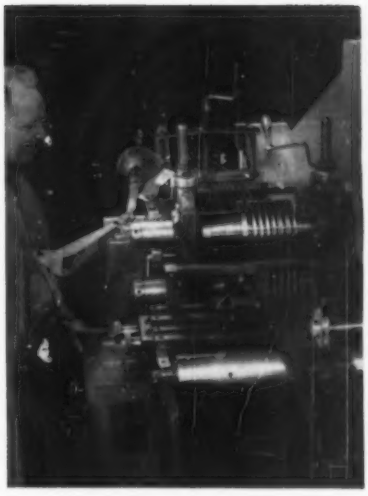
Then last July, for the first time in 25 years, average bond yields in the U.S.A. passed the average of common-share yields. The relationship soon reverted to the "normal" pattern through the mechanism of lower prices for equities. (The influence of doubtful business prospects clouds the argument here.)

But the fact is, analysts note, bonds yield more in most nations around the world—markedly where there is some sort of "state capitalism" and in the newer nations which cannot match savings with investment needs. In these countries, government spending puts a constant pressure on purchasing power.

**The U.S.A., by the yardstick of government taxing and spending, may now be permanently in this category.**

What happens is this: The incentive to invest in fixed income securities such as bonds is replaced by the desire to protect savings against the depreciation of inflation and the ravages of a "watered-down" money supply.

The next few months should see a test of this theory in U.S. security markets.

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Here is a fine example of how a small investment in Yoder slitting equipment greatly simplifies and speeds production while effecting important operating economies.

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If your steel strip or sheet slitting requirements are as low as 100 tons per month or even less, a medium size Yoder slitter can be a very profitable investment for you. The Yoder line includes units of every size and capacity . . . of the most advanced engineering design. Send for the Yoder Slitter Book —a comprehensive text on the mechanics and economics of slitters and slitting line operation, with time studies, cost analyses and other valuable data. Write to:

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The price of bulk oxygen has dropped about 80% in 12 years, while most other prices have risen. Oxygen is now being produced in large quantities for a few pennies per 100 cubic feet.

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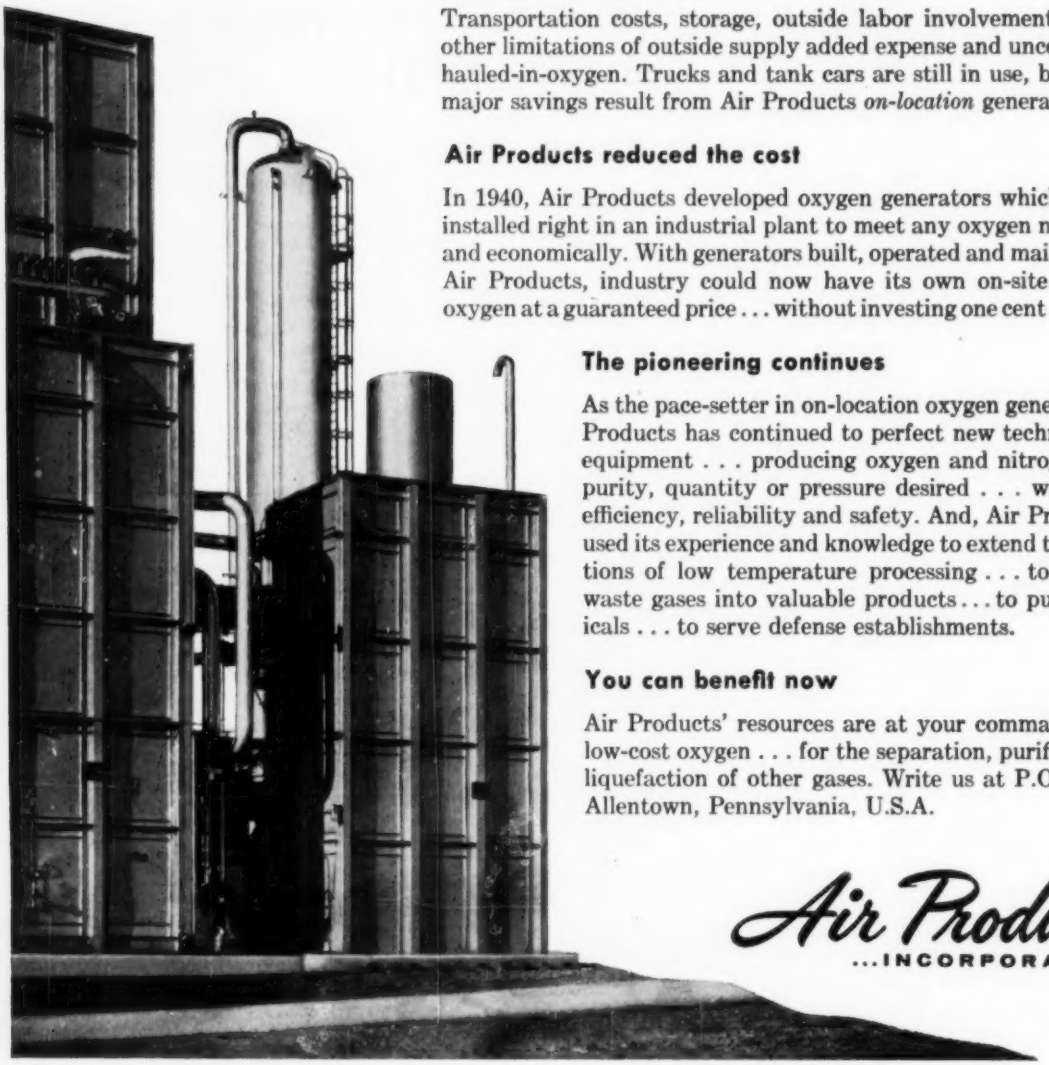
In 1940, Air Products developed oxygen generators which could be installed right in an industrial plant to meet any oxygen need, safely and economically. With generators built, operated and maintained by Air Products, industry could now have its own on-site supply of oxygen at a guaranteed price . . . without investing one cent of capital.



### The pioneering continues

As the pace-setter in on-location oxygen generation, Air Products has continued to perfect new techniques and equipment . . . producing oxygen and nitrogen in any purity, quantity or pressure desired . . . with greater efficiency, reliability and safety. And, Air Products has used its experience and knowledge to extend the applications of low temperature processing . . . to transform waste gases into valuable products . . . to purify chemicals . . . to serve defense establishments.

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**THE INDUSTRIAL DESIGNER** walks the tight rope between product ideas and potential profits. His knowledge of style and psychology can put . . .

# Magic Behind Your Merchandising

Digested from BUSINESS, Oct, p66; PRODUCT ENGINEERING, Oct 7, p28

DESIGN OF A NEW PRODUCT begins at the front door of the eventual consumer. Without consideration of the needs and tastes of the buyer, introduction of a new or revised product works in a vacuum. This is as true when you supply machine tools and instruments as when your business is automobiles or quality pottery.

The modern buyer has been conditioned to demand the best, the most convenient, the most attractive. When your salesmen go out in the field, they meet this problem head on. Despite the functional value of your product, it has a competitor of one kind or another. Its extra assets depend on its looks, ease of use, and subtle values suggested by the design.

## I. Management's Confidant

Such a framework puts the industrial designer in a unique position. A newcomer in the scheme of things, he stands with management at a command position behind the merchandising front lines, one arm around the engineer and the other encircling the sales manager. His job is to understand the problems of both: what can be economically made by his company or client, and what prospective customers want in function, comfort and style.

**A British engineering firm not long ago came out with a domestic appliance,** the brain-child of its works manager and draftsmen. The product was useful, unusual, well-made and reasonably priced. But it failed when it hit the market.

The works manager decided that the product lacked "contemporary styling" and called in a design consultant to dress it up a bit. Some of the designer's sketches had to be modified to fit production needs and keep the price in line. The restyled model was not as efficient as the original. Other changes had to be made. When the product finally reached the market, it failed again. The experience illustrates the faulty economy of considering the design aspects of a product at too late a date.

## II. Salesman Extraordinary

The firm's failure also pointed up some fallacious thinking about industrial designers. Their job is not to pretty up packages and products. Top designers are practical men. Their special talent is the ability to synthesize factors of engineering, cost, and consumer needs into a product that sells. A leading American designer describes his job as aiding in the development of a product that makes people "safer, more comfortable, more eager to buy, more efficient—or just plain happier."

**It has been said that the industrial designer came into being because engineers are not trained in esthetics.** Actually, design is a specialty in itself, requiring as long and as thorough training as engineering. A designer often will have a background in engineering, but his outlook is different. He must have a feel for the consumer's thinking, a talent for structural visualization, besides a basic knowledge of color and form. If he is a real leader in his profession, he will have artistic courage and daring.

Good design means extended business. In recognition of this, industrial design has emerged as a profession. Many companies today strengthen their engineering and development teams with men trained in esthetics; others rely heavily on design consultants.

## III. Role of the Consultant

As with other consultants, a professional designer can prove of value to either small or large firms. His value to a small company is obvious. Design and packaging changes occur infrequently; the amount of work involved may not warrant having a man on the staff. The design consultant is called in when management has a special problem: a new product, dissatisfaction with the style of its present line, plans for an extended merchandising program.

**The design consultant may or may not have prior knowledge of the industry involved.** Though some firms distrust the complete stranger, his ability to do a good job will not depend on this. A fresh approach often is of more value than product knowledge.

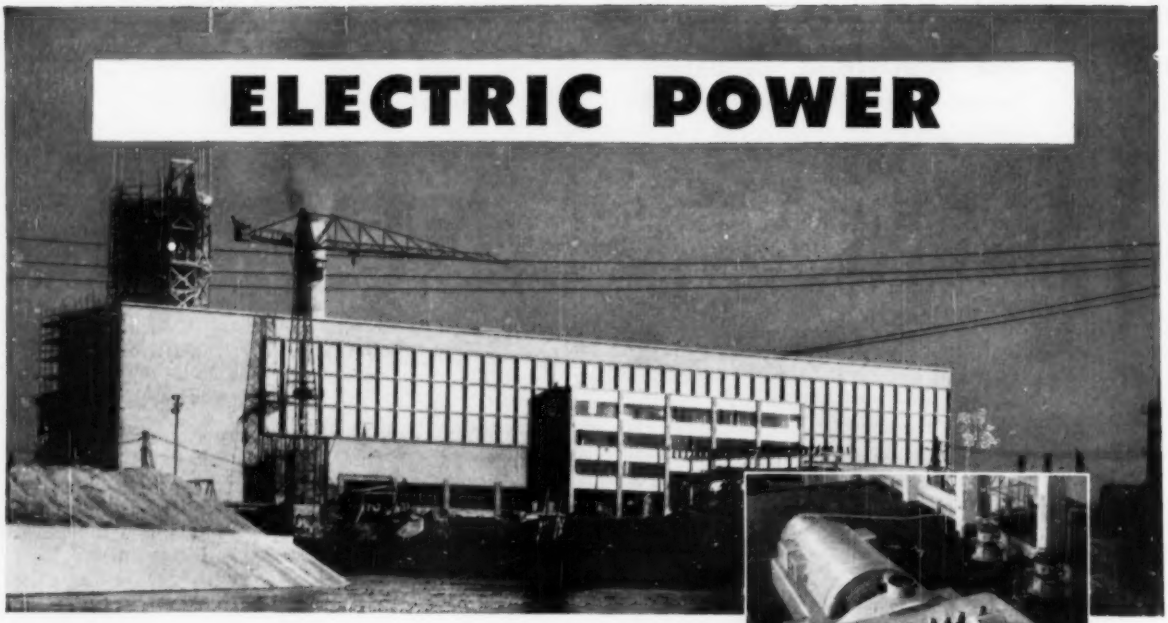
His first task, in all events, will be to understand his client's business. He must be briefed on the company's line of goods, its competitors, and must have a pretty good idea of the firm's past successes and failures. He must do more than merely understand management's aims in redesign: He must be able to throw his full enthusiasm behind these aims.

The competent consultant understands that his job is to make money for his client. He appreciates that every line he draws may add to manufacturing costs. His recommendations have to be geared to the client's equipment and manpower. His efforts have to add value to a product.

**Large firms are increasingly turning toward design consultants, even though they employ a large staff of designers.** In many cases they are looking for prestige, imagination, a new approach, pace-setting ideas that have not been forthcoming from their own staff.

Employment of a consultant is no reflection on a company's reg-

# ELECTRIC POWER



30,000 kw Allis-Chalmers steam turbine-generator in the Torino plant. Other units available from 2000 kw through 500,000 kw capacity.

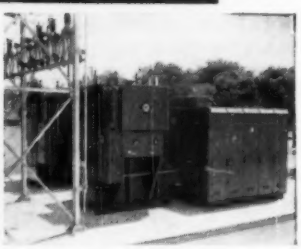
## Allis-Chalmers equipment helps meet world power demands

In Torino, Italy, the modern power station shown above uses an Allis-Chalmers steam turbine to expand the nation's production of electric power.

Allis-Chalmers industrial machinery in countries throughout the world is at work to produce not only electric power, but more cement, metals, chemicals, paper and manufactured products.

Every major industry finds Allis-Chalmers a dependable source of basic machinery and valuable application experience. Consult the distributor in your country, or write Allis-Chalmers, International, Milwaukee 1, Wisconsin, U.S.A.

The builder of over 16 million installed hydraulic turbine horsepower, Allis-Chalmers makes all types of hydraulic turbines — Francis, propeller, and impulse.



Allis-Chalmers builds all major equipment for electric power distribution — substations (illustrated), transformers, circuit breakers, and switchgear.

A-5368

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*A Division of Allis-Chalmers Manufacturing Company*

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**BELGIUM**—Brussels.
**BOLIVIA**—La Paz.
**BRAZIL**—Rio de Janeiro, São Paulo, Recife (Pernambuco), Porto Alegre.
**BRITISH BORNEO**—Sandakan, Jesselton.
**BURMA**—Rangoon.
**CANADA**—Montreal, St. Thomas
**CHILE**—Santiago.
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**COSTA RICA**—San José.
**CUBA**—Havana.
**DOMINICAN REPUBLIC**—Ciudad Trujillo.
**ECUADOR**—Quito.
**EL SALVADOR**—San Salvador.
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**GUADELOUPE**—Pointe-à-Pitre.
**GUATEMALA**—Guatemala City.
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**HONG KONG**—Hong Kong.
**ICELAND**—Reykjavik.
**INDIA**—Bombay, Calcutta.
**IRAN**—Teheran.
**IRAQ**—Baghdad.
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**ITALY**—Milan.
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**SARAWAK**—Kuching, Sibu, Miri.
**SINGAPORE**—Singapore.
**SOUTH AFRICA**—Johannesburg.
**SPAIN**—Madrid.
**SURINAM**—Nieuw-Nickerie, Paramaribo.
**SWEDEN**—Stockholm.
**TAIWAN**—(FORMOSA)—Taipei.
**TANGANYIKA**—Dar es Salaam.
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**TURKEY**—Istanbul
**URUGUAY**—Montevideo.
**VENEZUELA**—Caracas.

ular personnel. The permanent staff unavoidably becomes too wedded to the past. What often is required is a complete break with the company tradition. Taking some man who has done wonders for some completely unrelated industry often starts a firm on new roads to success.

### IV. Foreigner in the Plant

Bringing a design consultant into a plant may pose problems. Management and the sales organization may be sold on his value; but the engineering staff often resents him. To them he is an interloper, a man who appears to have been hired only to get in their way and slow up their work.

Realistically, the consultant's recommendations do often conflict with engineering plans. The danger of this will be minimized if he is called in early and if management gives him the status his creative work deserves. Too often he is unceremoniously deposited in the engineering department as some one who will "see that the product looks good."

**Management must make it clear that the designer is there to implement company policy.** He has been hired or retained to further the firm's business. If he is a qualified man, he will respect the engineer's knowledge and avoid changes that will interfere with the functional mechanism of a product. He will use the company's engineering talents in furthering company aims.

### V. Who Decides What?

How much freedom should a designer be given? Whether he is a consultant or a staff member, he is paid to be creative and to have the courage to break new ground. He must be given this opportunity. His ideas should get a sympathetic hearing by management, no matter how novel and revolutionary they are.

**However, the designer is always a member of a team**—including engineers, production men, cost estimators, marketing, and merchandising experts. His design changes must be evaluated by management on the basis of this consensus. The final criterion: How will these changes affect cost? How will they improve gross sales? ●

# Wages War on Oil Prices

**Gottlieb Duttweiler,** Swiss marketing man and self-styled apostle of lower prices, is extending his battle with the oil industry to West Germany. Head of the Federation of Migros Cooperatives in Switzerland, Duttweiler began in 1954 a campaign against the major oil suppliers in Switzerland. The result has been that Swiss gasoline prices are substantially below the European average.

Now the Federation's petroleum subsidiary, Migrol, plans to build a refinery in Emden, Germany, at a cost of $17.5-million. The aim, according to Duttweiler representatives, is to cut German gasoline prices by 10 cents a gallon (it is now roughly 61 cents).

Work on the Emden refinery is to begin in March, with production beginning in October, 1959, at a rate of 30,000 barrels daily. Duttweiler's associates claim that major oil marketers in Germany will begin to reduce prices even before the plant is on stream.

**Past Duttweiler enterprises have featured lower prices and profit-sharing;** his supermarkets and tourism schemes have had world publicity. The oil scheme will not be an exception. Marketers of the gasoline will be offered common stock in a new company, Frisia Oil Co., and German motorists will be offered preferred shares for $25—which the Duttweiler promoters say will give them a chance to "regulate their own gasoline prices." ●

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## YOU AND YOUR PERSONAL AFFAIRS

**While driving into the city every morning, a New York businessman chats with a friend in the British West Indies.** A small but powerful radio transmitter in the trunk of his car marks him as one of the world's 210,000 radio amateurs.

If you have a short-wave receiver in your home, you already have half the basic equipment for a home radio "shack"—though most amateurs consider all-band receivers too insensitive.

**What do radio amateurs get out of the hobby?**

First of all, there is usually a fascination with the mysteries of radio. Beyond that, interests vary as widely as personality. Some amateurs have a passion for contacting distant and elusive stations; there are international contests for these "DX hounds." Others play chess, or merely chat for hours. Radio amateurs—who call themselves "hams"—also perform valiant service during emergencies.

Amateur radio is strictly controlled by national and international regulations—and some countries ban it altogether. To get a license you will almost certainly have to pass tests in basic radio theory, regulations, and Morse Code.

**Probably the best source of information on amateur radio is from an active "ham."** There is a series of handbooks and pamphlets available—for a price—from the International Radio Amateur Union, which also publishes a magazine called *QST* ($5 per year). You can get in touch with the member society in your country, or write to the American Radio Relay League, West Hartford, Connecticut.

**Radio is not necessarily an expensive hobby.** Experts say a complete and efficient amateur station can be built for as little as $50. However, most of today's amateurs buy commercial sets. Transmitters and receivers are available either assembled or in "do-it-yourself" kits (about 25% less).

Receivers manufactured specially for amateurs sell for as little as $40 to around $1,000. Price reflects sensitivity, frequency stability, and selectivity.

Some hams prefer voice transmission, others code; many are equipped for both. And a pioneering few are using teletypewriters, even television.

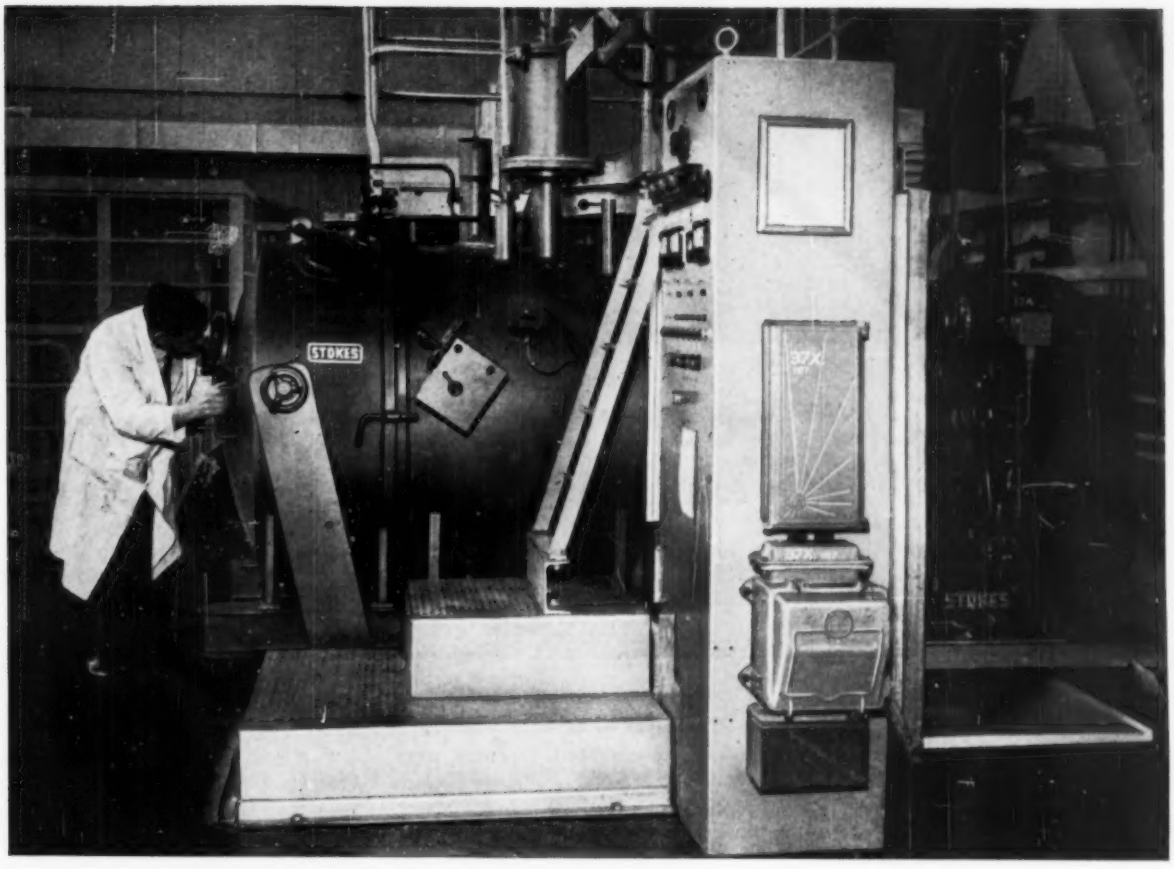
Transmitters for code only can be had for under $50; for code and voice, under $90. A 75-watt transmitter costs in the neighborhood of $300, 200 watts around $450. Most countries limit amateurs to 200 watts; but 10 watts is enough to take you around the world in good weather. Price factors other than power include such things as variable frequency oscillation, bandswitching, and single-sideband.

There are plenty of gadgets and accessories, too. Surveys show the average amateur owns $800 worth of equipment.

For $4.50 you can buy the Radio Amateur Call Book (608 South Dearborn St., Chicago 5, Illinois, U.S.A.). It lists the name, address, and call letters of every licensed "ham" radio operator in the world.

●

**Interested in United Nations postage stamps?** The first official philatelic book on all U. N. issues through 1957 is now available from any U. N. sales agent for the equivalent of U.S. $0.85, 6/—Sterling, or 3.50 Swiss francs.




# "Harwell" uses Stokes Vacuum Furnace for nuclear fuels investigations

The United Kingdom's Atomic Energy Research Establishment at Harwell, Didcot, Berks., England, has had this Stokes Vacuum Furnace in successful operation since late 1956.

The furnace is used to investigate methods for simultaneously melting and pouring uranium under vacuums of 1-10 microns, at temperatures of 1200-1400° C. The work is part of an experimental investigation of pyrometallurgical processing for nuclear fuels as a possible alternative to "wet" chemical methods.

This is but one of many widely varied applications of Stokes Vacuum Systems—used for research and development programs and for many practical production operations.

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# Sprayed-on Foam Speeds Insulation

Digested from CHEMICAL ENGINEERING, Oct, p158

THE LATEST ADAPTATION of that revolutionary new material—urethane foam—now can sharply reduce the manpower needed for insulating process tanks, cold-storage boxes, pipe lines and many other industrial fixtures. The synthetic polymer, whose other promising uses are described on the opposite page, is sprayed on metal or masonry and foams up into a quick-setting layer of rigid or resilient insulation.

Spraying urethane foam on walls and pipes became a commercial reality only after new formulations and highly intricate equipment had been developed. Factory manufacture of the air-bubbled material is itself an accomplishment, the result of years of development in Germany and the U.S.A.

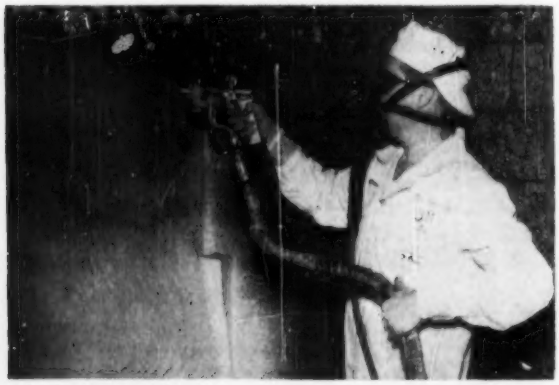
But combining the chemicals at the job site, as a surface is being sprayed, added some delicate engineering problems. The combined ingredients had to foam and set fast enough to get the desired thickness without sloughing or falling away; at the same time, the polymer could not be allowed to set so fast that it would clog the spray gun.

**The success of such equipment was demonstrated recently** when two workers of Solvents & Plastics Co., U.S.A., sprayed a 2-centimeter-thick insulating lining of urethane foam on a chemical process vessel in 8 hours. While this was being done, a four-man crew of another contractor took 6 days to insulate an identical tank with magnesia blocks. The tally: 16 manhours for sprayed-on urethane foam, 192 for magnesia blocks.

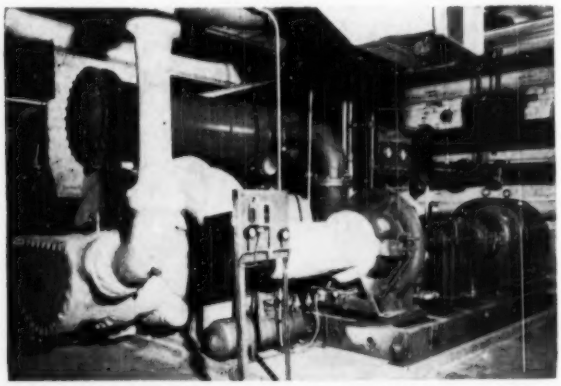
The specially designed spray equipment mixes the ingredients in accurate proportions and dispenses a thin film on the tank surface. The film immediately expands and then sets into a sturdy insulating blanket. A liquid coating of about 2 millimeters becomes a foam 2 centimeters thick. Various densities of insulation can be produced, with final thicknesses of from ¼ to 5 cm. The foam normally is sealed after application to protect it from water vapor.

Earlier this year Solvents & Plastics Co. also insulated a 300-ton air-conditioning unit with urethane foam, covering piping, valves, and flanges with 2½ cm of the material and the unit itself with 5 cm. Despite the odd shapes of equipment, the complete job took two men only three days. An extra advantage of the method, engineers noted, was that the flange could be removed and then readily resealed with another coating of urethane.

**Another American pioneer in the development of sprayed-on urethane foams** is Minnesota Mining & Mfg. Co., who recently used



**NOVEL MATERIAL foams and sets moments after it has been applied by intricately-engineered spray gun.**



**ODD SHAPES present no special problem for applying urethane foam on 300-ton air-conditioning unit and piping.**

the material to insulate a large icehouse at one of the chemical plants of E. I. du Pont de Nemours & Co. Du Pont, a maker of one of the essential ingredients in urethane, had been eager to see the successful demonstration of sprayed-on foam. Two urethane applications at the company's plants last year had not proved satisfactory.

The latest insulation job, however, proved trouble-free and economical. The walls and ceiling of an icehouse measuring 15 by 17½ by 2¾ meters were hand-sprayed in six man-days.

Minnesota Mining had spent two years developing the spray equipment used on this last job. The firm now is marketing a package unit (consisting of a gun, proportioning equipment, and hose for applying urethane foam) selling for $8,950.

**Though the price of urethane foam is higher** than alternative insulation materials, the speed of application and the labor saving make it competitive. Safety requires that gun operators wear pressure-fed masks (the isocyanate vapors can be irritating) and Minnesota Mining provides the services of an engineer with their packaged unit to train a customer's personnel in the first application. ●

## Urethane Uses: Coats to Cars

URETHANE FOAM is a polymer made by reacting isocyanates with various polyester (and more recently, polyether) resins. The addition of water results in the generation of $CO_2$—and foam.

The final product can be either flexible or rigid, which has helped it find service in everything from machinery insulation to clothing linings. Resistant to oil and dirt, it is reported to be stronger than foam rubber and to have excellent insulating and electrical properties. Flexible urethane foam can be dyed, cut in any shape, stapled, glued, or sewn.

**FURNITURE.** Urethane has been rapidly finding a place for itself in furniture-making. One manufacturer uses it for furniture arms and backings. Its use for cushions had been somewhat held back because it was less springy than foam rubber. A recent development, utilizing polyethers rather than polyesters, overcomes this difficulty.

Designers of seat cushions for transportation equipment, on the other hand, have leaned toward the ester foam product. They prefer cushioning that does not bounce the rider endlessly. Ester foam resists compression initially and comes back more slowly than rubber or ether urethane.

**AUTOMOBILES.** Both ester and ether urethane foam are going into the latest models of American automobiles. Most 1957 models with "crash pads" over the dashboard use urethane for this purpose. Some seat topper pads, the 3 to 5 cm covering over seat springs, also will be made from urethane, replacing foam rubber.

Chrysler Corp., which will go to ether-type urethane for pads in 1958 production, already has found another novel use for the foam. Some 1957 De Soto and Chrysler models substitute a section of wire-reinforced urethane for conventional springs where the back seat crosses the driveshaft tunnel.

**CLOTHING LININGS.** As a lining in garments, urethane foam offers warmth without weight. Many manufacturers are turning to the new material in their current fashions. They find that a 3-cm sheet of urethane with its tiny air cells is equivalent in warmth to a bulky 16-oz wool batting. Also, the new material does not shake down and mat into lumps after washings.

**VARIED APPLICATIONS.** Toys, pillows, paint rollers, and rug underlays are among the other products that are being made from urethane foam. Skepticism about its aging properties has held up urethane's general use in mattress making. Its price advantage as against foam rubber, however, is encouraging trial uses. One manufacturer puts a thin layer of urethane over coil springs to improve his lower-priced mattresses. (*Modern Plastics, Sept, p* 115)


# AAF Dust Collectors Mine Uranium From Thin Air

**AAF UNITS CONTROL DUST, RECLAIM VALUABLE PARTICLES.** When a large uranium mill developed a new, improved ore processing operation, they also developed new dust sources. AAF ROTO-CLONES controlled the troublesome dust, and *also* recovered extremely fine particles. These particles were found to contain 4 to 7 times *more uranium* than the run of ore, and are rapidly repaying the cost of the dust control system.

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# Here are 3 more NORDBERG MACHINES to reduce costs on Track Maintenance Work

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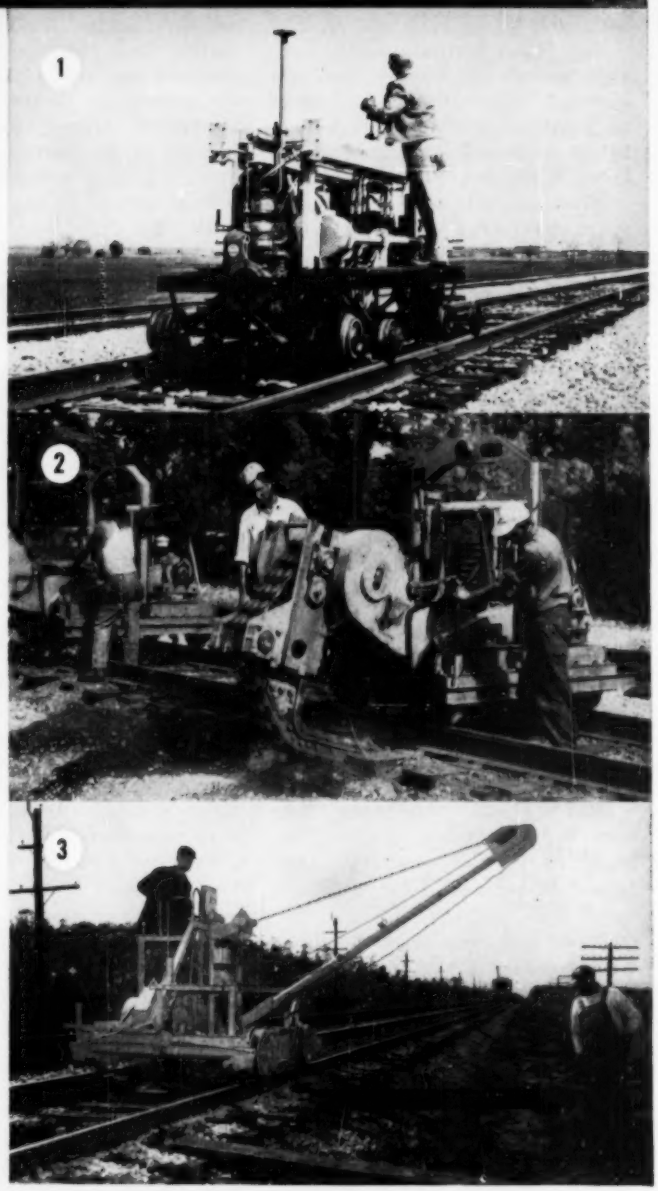


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XR157

**NEW PACKAGES from around the world are placing many products under the push-button thumb of the consumer. Latest are drugs—such as the inhalant shown at right.**

# Now: Push-button Drugs Make a Debut

TECHNICAL IMPROVEMENTS are rapidly expanding the marketing frontiers of aerosols in every country of the world. These push-button, gas-filled containers, originally developed as dispensers of insecticides, have found a secure place for themselves in the packaging of perfumes, cosmetics, hair lacquers, paints, among other products. Most rapid recent strides have been made by the drug industry, largely as a result of advances in valve design and chemical formulations.

**An aerosol valve now permits accurate measurement of prescribed amounts of pharmaceuticals.** The valve has been put to use by one firm for the dispensing of octyle nitrite, for the relief of certain types of heart disease. As the valve is depressed, the prescribed dose of medicine discharges through a plastic tube and is inhaled.

Another application of the valve permits a patient to inhale a mechanically - measured preparation for the relief of asthma. The drug dispenser is used with a plastic breathing tube. Holes in the tube automatically mix air with the medicine.

A new emulsion system has also cleared the way for dispensing many drugs and related products in aerosols. The new system allows water-based products to be dispensed as true sprays rather than as foams. According to research men of E. I. du Pont de Nemours & Co., Inc., the development will speed the pressurized packaging of such items as water-soluble antibiotics, depilatories, poison ivy remedies, and lotions.

**Each year, more products can be economically packaged in aerosol containers.** The biggest U.S. packaging boom in 1956 was in aerosol hair sprays, which accounted for about a fourth of all aerosols sold. Other big money-makers have been insecticides, shaving creams and paints. Now, drugs loom large in the field.

Any consumer product that is applied by brushing, spraying, dusting, or rubbing may be packaged in a pressurized container. Surveys indicate that aerosol packaging attracts consumer interest, commands a higher price, and promises increased sales and profits.

About 50 different pharmaceuticals already are available in pressurized containers. An item recently introduced in England dispenses an antibiotic powder from a liquid suspension. The propellant vaporizes and the drug is deposited on a wound as a powder.

Other medicinal preparations being dispensed by aerosol in Europe and in the U.S.A. include burn remedies, adhesive tape removers, topical anesthetics and plastic bandages. The list is being added to constantly as propellants are improved, and new formulations worked out for combining these propellants with therapeutic agents.

**Manufacturers of loading equipment, containers, and valves** have appeared in many industrial communities in the world. Note how aerosol sales in various European countries increased between 1955 and 1956: England, from 3 million packages in 1955 to 10-million in 1956; Sweden, from 250,000 to 1.3-million; Germany, from 5 to 7-million; The Netherlands from 250,000 to 2.5-million.

Aerosol "loaders" also have set up shop in many markets—an estimated 60 in the U.S.A. and about the same number in other countries. These custom-packaging firms, along with the makers of equipment and propellants, are in a position to advise on putting your product into an aerosol package. ●

**SUN TAN OIL applies quickly, cleanly, evenly, from an aerosol can.**

# More Power, Automation, at Hanover

**POWER:** European tool builders continue to increase horsepower of their machines.

**AUTOMATION:** Program control, automatic cycling show up on many new tools.

Digested from AMERICAN MACHINIST, Oct 7, p158

European machine-tool manufacturers are leaning more and more toward automation. This trend was evident in the equipment shown at Hanover, Germany, by the 961 participants to the Fifth European Machine Tool Exhibition.

On display were many machines having a limited form of program control and automatic cycling—with push-button and other methods of presetting the cycle. Those with complete program control included Switzerland's SIP jig borer-millers, Britain's Newall jig borer-millers, Belgium's Progress lathes, and Germany's Heller millers. One SIP machine has a memory unit for repetitive work and can use punched cards.

The 1957 Hanover tool show was larger than any of the four that had preceded it. Exhibits spread through ten massive buildings and occupied a total of about 52,000 square meters.

**German manufacturers dominated the show with 650 exhibitors,** about 500 of them machine tool builders and the others makers of small tools and accessories. Also exhibiting were 86 Swiss firms, 65 Italian, 44 British, 42 French, 19 Austrian, 18 Belgian, 18 Swedish, and 13 Dutch.

American manufacturers were excluded because European machinery cannot be displayed in the U.S.A. Several British and Continental firms, however, showed machines built to U.S. design.

**The show revealed that European manufacturers are continuing to increase the horsepower of their machines,** building many gigantic assemblies, and getting flexibility through increased automatic handling. Heller exhibited an in-line transfer unit that completely machines the rear axle housing of a German bus.

Britain's EMI Electronics displayed an example of punched-tape control on a Cincinnati hydrotel. It gave the machine impressive flexibility. "Perforated tape" control was shown on a French GSP twin-spindle machine for jig drilling, boring, tapping, and milling.

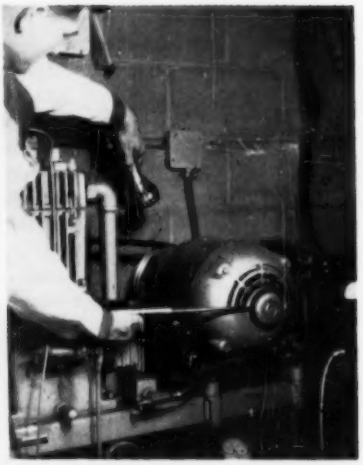
**Electro-hydraulic control appears to be gaining ground with tool builders.** Such controls are applied to dividing heads, the rise and fall of milling machine knees, and automatic cycling. Britain's Heenan & Froude exhibited a strip-forming machine featuring all-hydraulic operation and control. Germany's Ravensburg had a surfacing lathe with hydraulic copying equipment.

Several interesting developments were shown by Germany's VDF. Among them was a double copying lathe for machining both ends of a workpiece simultaneously, the work being chucked about its center. Also shown by VDF was a deep-hole boring lathe on which the boring slide is driven by a worm-form rack instead of a leadscrew to reduce backlash, and central chip removal replaces central coolant delivery.

An interesting milling cutter adapter for face- and shell-type mills was shown by Karl Bruckner, Germany. It featured a precision centering sleeve with a special mandrel to hold the tool. It is said to permit heavier feeds and higher speeds on older machines.

**Intense competition was in evidence among German tool builders.** The proof: 31 builders showed copying lathes; 27 exhibited turret and capstan lathes, 37 had special drilling and boring machines. And the growing versatility of tools made machines of one type competitive with other types for the same job. ●

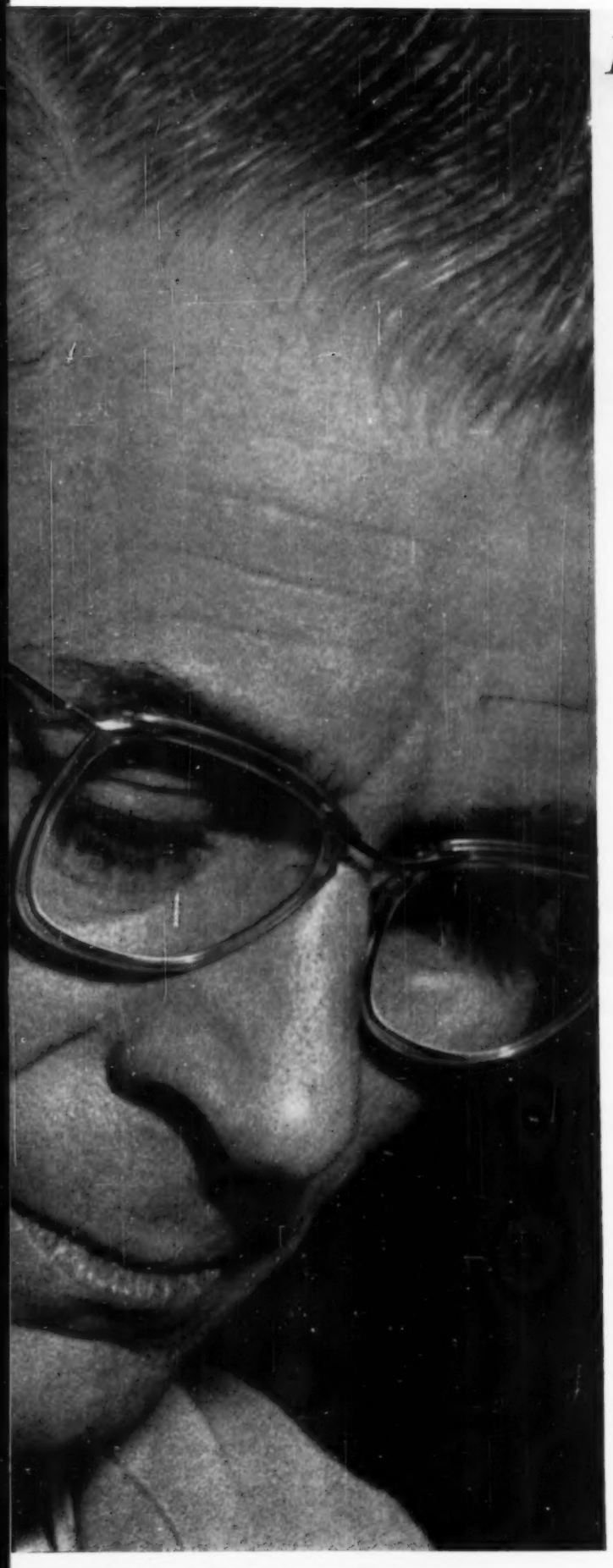
# Looking for Trouble?



**ELECTRONIC PROBE checks the extent and source of vibration in a motor-driven compressor.**

Vibration is the first sign of impending disaster for rotating machinery. When a pump or turbine begins to shimmy, the normal practice is to call in the man with the "trained fingertips." Such fingertips now have been replaced by an electronic probe—the vibration analyzer.

Use of this electronic tool leaves nothing to chance. It gages the degree, frequency, and angle of vibration at different parts of a machine, converting this information into electric signals that pass to a portable console. A maintenance man is able to quickly and accurately locate the source of trouble. The imbalance of a machine can be corrected to within 10 microns. (*Power, Oct, p111*)



# *I HAVE A RIGHT TO SAY SO...*

*Personally, I have been working on the engine line at Renault for 20 years. I started young at the shop to learn from the old timers. Little by little, I proved my capacities... until such time as I was appointed "engine tune-up specialist" and here am I now, a foreman on the engine line.*

*I feel therefore I am entitled to say that I am thoroughly familiar with my job. Besides, I am not the only one here to qualify as such as approximately one out of four in our group has been with the company for more than 20 years, just like myself. These people represent the strong foundation of our team with its traditions and recollections.*

*And everyday we discover new reasons to be proud of our firm... We know that, at Renault, sizes are controlled down to a thousandth of a millimeter and under, everything is carefully checked and there is no "trifling" with quality standards.*

*The Renault formula is simple: everybody to do the right job in the right place. Everyone of us likes his job and fully cooperates to the sucess of the firm.*

*Those who remember seeing the 4CV model at its early production stage, ten years ago, know that 800,000 units of this type are in operation all over the world. The younger people now have the Dauphine. I was already probing the engine at the time when everybody in France was wondering about how it would look. I knew the engine would be wonderful... you get the feeling of it on the test bench. And I knew you could depend on our engineers... At the present, the Dauphine proves to be an outstanding successful model. I was glad to hear about it as I know it fully deserves its reputation. And therefore I may safely state, from my own experience, that*

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Modernizer Carter Higgins (left) tells how his company is using ingenuity in place of large sums of cash—and tripling its productivity.

# How to Pay as You Rebuild

Digested from FACTORY MANAGEMENT & MAINTENANCE, Oct, p110

TO OPERATORS of small factories, "modernization" sounds like a big word. It carries with it the threat of huge expenditures, long-term borrowing, cash outlays today for revenues in the distant future.

It doesn't have to work that way. You can modernize on a pay-as-you-earn basis. Worcester Pressed Steel Co. (gross sales: $3-million a year) found that it could substantially rejuvenate its metalworking plant in Massachusetts, U. S. A., by an investment of $200,000 over a period of three years. Further, savings from reduced cost would begin showing up as soon as the plan got under way. For each dollar spent on modernization, fifty cents a year savings would result.

**The heart of the program was a detailed study of the manufacturing output** of the factory per square meter of floor space, in comparison with productivity at 40 similar plants. Carter Higgins (picture above), company president, found that output could be tripled without enlarging the Worcester factory. This is now being done by a three-part plan: a new layout of departments and machinery (at a cost of $57,000); rehabilitation of about half of the factory's presses ($64,000); redesign and improvement of tools over a period of three years ($48,000). The remaining $30,000 has been set up as a reserve to cover unforseen contingencies.

Of the total $200,000, only 25% will be earmarked as capital expenditures. The rest will be spent for overhaul and improvement, with the company's own maintenance crew doing a large part of the work. Expense items not lengthening machine life will be written off as they occur. A strict rule at Worcester Pressed Steel is that all expenditures for individual projects must be recovered within two and a half years.

## I. Relocation

This step required the movement of 105 of the plant's 150 presses and machine tools, after certain work had been done on the building itself.

Relayout of the plant began with the elimination of an obsolete rolling mill facility, which provided space for the initial blanking presses close to the raw materials warehouse. Raw materials previously had to travel 365 meters to blanking operations. Relocating these machines took two weeks and was done by the company's own men.

Production flow at the redesigned plant follows a U-shaped pattern. Raw materials come in at the bottom of one leg of the U, and the new shipping area is located at the end of the other leg. Servicing operations such as washing, annealing, and tumbling will be located in the center of the flow pattern, so that parts can be taken in and out of these operations without interrupting the in-line flow of production parts.

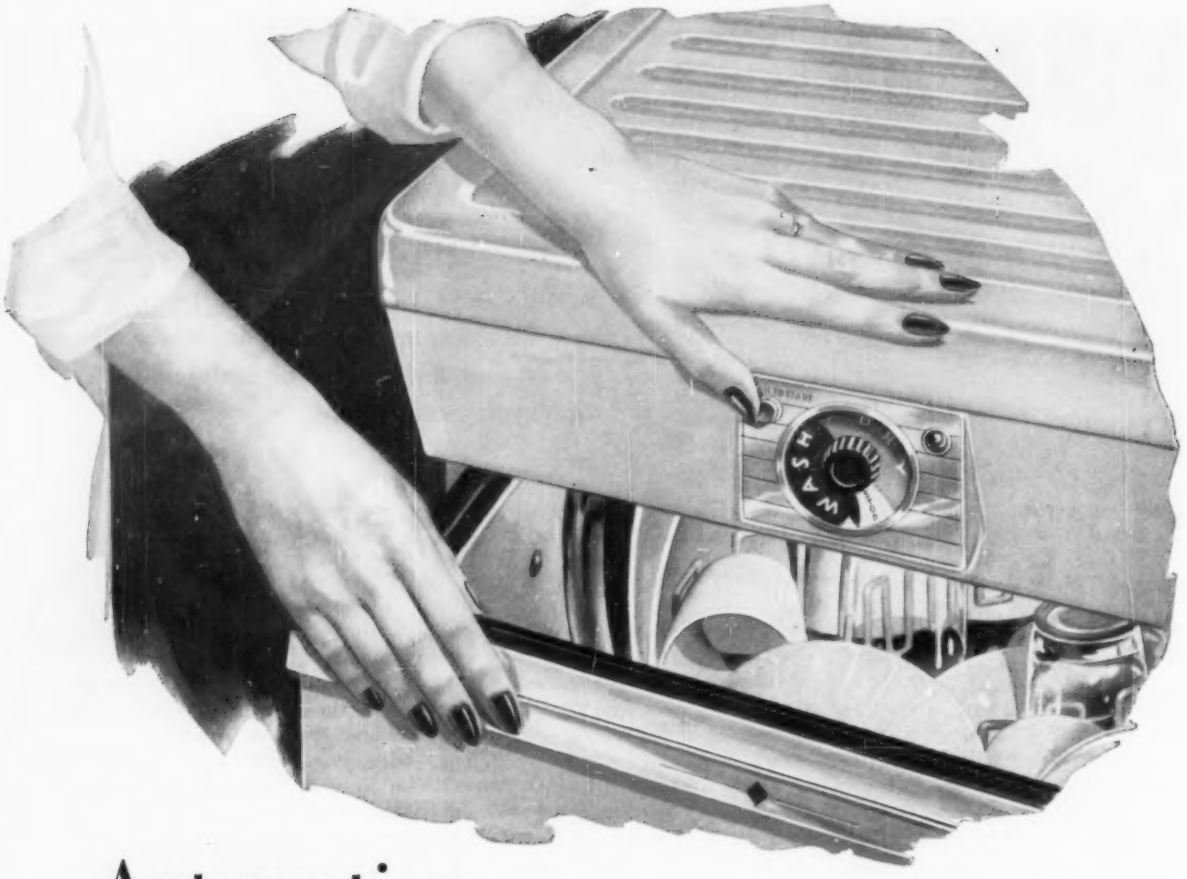
**In planning the production pattern, the firm's operating team studied the flow of parts** to determine where each operation should be located for utmost efficiency. This was relatively difficult with the wide variety of operations involved in all kinds of stampings, large and small. One hundred of the company's most common jobs were used as the basis for the analysis.

Major savings will come from reduced handling of production parts. There will be a better flow of materials through the plant, and improved handling within individual operations. More work area at each press will relieve congestion and permit easier truck access to machines.

## II. Rehabilitation

An early analysis showed that most of the presses could be brought up to modern standards at a nominal cost. The work included realigning press beds and rams, replacing press components and motor drives, and general overhaul of production equipment. Presses will be made movable by the use of vibration-proof mounts and in some cases casters.

Half of the overhauling will be done by the company's own maintenance men, and the rest by press manufacturers' specialists. The estimated annual savings of $30,000




# Automation...

## *Proved in the Home—Ready for Factory and Farm*

***In millions of appliances, Mallory Timer Switches automatically control complex work cycles . . . now offer low-cost automation for machines performing varied operations on preset time cycles.***

With dishwashers, clothes dryers and home laundries taking on a large share of tiring chores, millions of housewives can testify that automation is a pleasant reality in the home today.

Dependable, automatic operation of these time-savers is made possible by a unique timer switch —a rugged, precision device developed by Mallory at a price that cost-conscious appliance manufacturers can afford.

Now this switch also works outside the home. For example, it masterminds the operation of an improved milking machine . . . acts as cook and cashier for new vending machines that provide varied hot and cold food in factories, schools, public places.

Readily adaptable to almost any series of operations, the Mallory timer switch offers the benefits of low-cost automation to a range of equipment from computers to temperature controls . . . from metal-working machines to plastic molding presses.

The dependable performance of this precision switch is typical of all Mallory products in electronics, electrochemistry and specialized metallurgy—the fields in which Mallory serves the Nation's growth industries.

P. R. MALLORY & CO. Inc.

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will come from reduced maintenance costs, less downtime for repairs, and the use of fewer repair materials.

### III. Renewal

This phase of the program involves the redesign and improvement of tools, as well as the purchase of new equipment over a period of three years. Standardization of tools and dies will be the aim. About 90 press bolsters will be redesigned, and dies and tools made to fit a standard bolster pattern.

Modification of the plant's 1,500 dies will be completed over a period of three years. The schedule of changes will depend on how quickly they can be made without interrupting production.

Each die will have standardized bolt holes and be usable in many presses. A worker will be able to make the die set-up in one fourth the time it used to take him. Savings will come from reduced set-up and maintenance time, better production methods, and reduced use of die repair materials and tools. ●

## New Hope for Leather Trade

A new machine has brightened the horizon of the chronically suffering leather industry. Still in pilot-plant stages, the machine offers an economical method of solvent tanning. Leather is tanned in a few minutes instead of days or weeks.

Other attempts at solvent tanning of leather have not gone far due to the prohibitive cost of the chemicals. The new Seco machine, developed in the U. S. A. jointly by Eagle-Ottawa Leather Co. and Secotan, Inc., recovers and recycles all the solvent used.

The Seco machine goes into action after hides have been prepared and had a brief soaking in tanning solution. The machine forces acetone through the hide to carry off all moisture. After a second dose of acetone with some fat liquors, the chemicals are driven out of the skin by heat. The key to the system is a patented masking device that fits the outline of the hide and insures that all solvent passes through the leather.

**This four-minute treatment produces clean, supple leather.** The machine subdues rather than emphasizes the natural scars and scratches in hides.

The leather trade is looking toward the new process for high quality rather than low cost. The industry is besieged by competitive materials: rubber, plastics, cord compositions. In the U. S. A., for example, the proportion of leather-soled shoes has dropped from 70% to 40% in 10 years time.

**How far solvent tanning will go toward helping the industry** get a larger share of the consumer's dollar is speculative. Small quantities of the new leather are being shipped to shoe manufacturers for their evaluation. A large shoe company, with tanneries of its own, has announced that it will spend $100,000 for pilot facilities to produce its own solvent-tanned leather. (*Business Week, Oct*5, *p*184)


The well known

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manually operated

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# Looking Ahead in Technology

● **NEW FIBERS have emerged from both U. S. and Japanese laboratories in recent weeks.** The latest American synthetic is Zefran, a "nitrile alloy" developed by Dow Chemical Co. It is said to exhibit versatile dyeing characteristics and to be usable with conventional textile machinery. Wear-tests are being made on skirts, men's sport shirts and suits. In Japan, Toyo Koatsu Industries, Inc. has introduced Urylon, a polyure fiber said to be stronger and more heat-resistant than nylon and to have a texture resembling wool. First production of Urylon will go into the manufacture of fishing nets.

● **GAS CONCRETE — a building material developed in Sweden**— appears to be headed for broad horizons in the U. S. building industry. American plants recently have been erected for the production of two similar but competing products, Ytong and Durox, each under Swedish licensing. The basic ingredients of Ytong are sand, lime and water; Durox also includes cement and gypsum. Both add aluminum powder to serve as a leavening agent. The evolution of tiny bubbles of hydrogen causes the concrete to rise into a lightweight cellular structure. Gas concrete building blocks have made an impressive record for themselves in Sweden. American output will be used for roof decks, floor slabs, panels and insulation. (*Chemical Engineering, Nov, p*162)

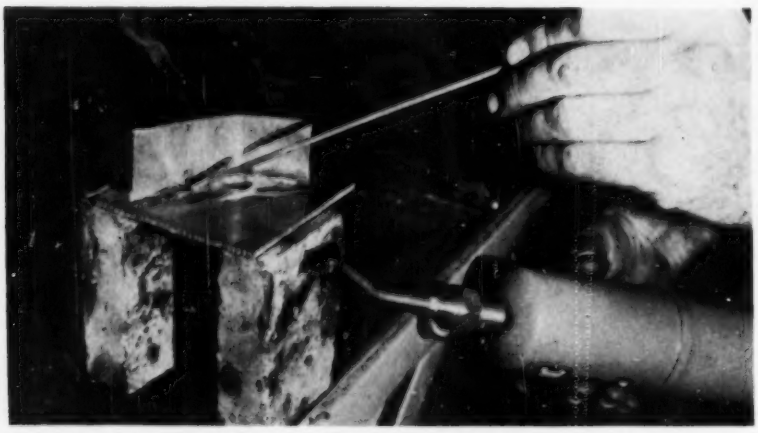
● **A PROTECTIVE PAINT that can be applied on rust** has been developed by a German chemical manufacturer, Otto Loewe. The metal surface to be coated first gets a rough cleaning. Then three or four coats of the paint, Corrolit, are applied. The covering is reported to have proved itself under extensive testing at a government material-testing laboratory. (*Chemical Week, Oct*5, *p*66)

● **SHIPMENT of liquefied natural gas** soon will be commercially feasible, as a result of research by Japan's Tokyo Gas Co. A practical method for shipping methane has been sought by the petroleum industry for some years. Tokyo Gas says it has solved the problem except for a few "technical difficulties"; it has plans for moving the gas long distances overseas in a few years. The company is lining up a natural gas supply—probably in the Persian Gulf area—and plans on building or converting a tanker with unique storage tanks and large refrigerating capacity. (*Petroleum Week, Sept*27, *p*51)

● **AERIAL SURVEYING has become a booming international industry in the past three years, serving timber companies, geologists, highway planners, oil and uranium prospectors.** More than a third of the income of the large operators—such as U. S.'s Worldwide Surveys, Inc. and Britain's Hunting Associates, Ltd.—comes from exploration work for mining and oil companies. Aiding them are high-speed cameras and some fancy electronic instruments: the magnetometer, which locates oil pools by recording variations in the earth's crust; the scintillation counter, which leads the surveyor to rare ores by picking up irregularities in the earth's radiation; and the shoran, a system that keeps a running record of the photographing plane's position. (*Business Week, Oct*19, *p*97)

● **PERMANENT MAGNETS as small in diameter as a human hair have been made from the alloy Cunife at the U. S. National Bureau of Standards.** The alloy consists of 60% copper, 20% nickel and 20% iron and displays unusual mechanical and magnetic properties. It is not cast or sintered into shape, but cold drawn.

● **CONTROLLED FUSION of hydrogen atoms may be on its way in England.** British scientists recently reported reaching a temperature of 5 million F in laboratory experiments, which may have resulted in a limited fusion reaction. Continuous fusion, such as occurred with the hydrogen bomb, is believed to require temperatures of 30 million F. (*Product Engineering, Oct*21, *p*12)



● **CHEMICAL BONDING of copper and aluminum may become commercially feasible with the introduction of a new product called InterAct,** developed by Intertectics, Inc., U. S. A. The joining material will aid the aircraft, automotive and electrical industries in the union of other non-ferrous metals, including magnesium, titanium, brass, zinc, silver and gold. Known as a "reaction eutectic," InterAct eliminates the surface oxide layer of metals and causes similar and dissimilar metals to flow together at temperatures lower than the melting point of either metal. Joining two thick sheets of aluminum (shown in photograph) gives a seam that is stronger than the metal itself.

PHOTOGRAPHED IN LUXEMBOURG, FROM THE PEPSI-COLA INTERNATIONAL PANORAMA MAGAZINE

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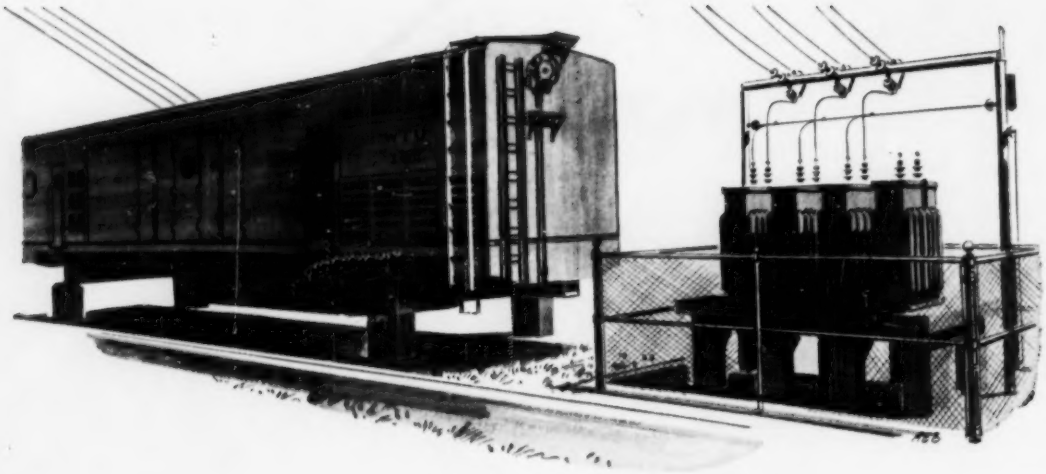

# 1000 kw. at local load relieves central generating station of 1300 kw. during time of peak.

The West Texas Utilities Company has placed an Electro-Mobile power car in service 125 miles from a central generating station. This unit, equipped with automatic control, provides 1000 kw. right at the point of need for peaking, better continuity of service, and voltage regulation.

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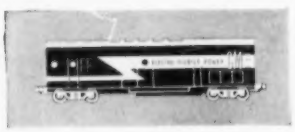
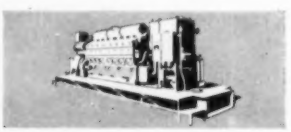
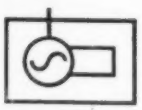
This versatility of the Electro-Mobile power car makes it the practical answer to many electric utility problems.







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GENERAL MOTORS LOCOMOTIVES

ENGINEER enters variable data through keyboard of new digital computer.

# New Crop of Computers

A NUMBER of relatively low-priced engineering and business computers have just come on the market. With the very high prices of most electronic data-processing machines, this is good news for management—although, whatever the price, the fact remains that no computer is by itself a sure guide to better business. It is justifiable only if it can pass the same tests as are applied to any important company purchase.

Engineers will be the main users of the 610 Auto-Point computer pictured above, a product of **IBM World Trade Corp. (807 United Nations Plaza, New York, N. Y., U. S. A.)**. The machine sells at $55,000, is small enough to be placed next to a secretary's desk. Though it is not a substitute for larger computers performing lengthy repetitive operations, the 610 Auto-Point will aid the engineer in design problems and also help in programming the much larger—and more expensive—computer units.

The 610 stores programs and data on punched tape and a magnetic drum. It is programmed and fed directly from the keyboard of a wheel-mounted console and an electric typewriter; answers are delivered either written on the typewriter or on punched tape. Correct positioning of the decimal point throughout all computation and in final results is assured by toggle-switch control. A feature said to be peculiar to the 610 is its capacity to assimilate new data fed into it while the machine is running (most computers have to be stopped if this is done).

Another digital computer, specially designed to control automatically such complex processes and tests as oil refining, wind tunnel velocities, engine test stands and speeds, has just come from **Ramo-Wooldridge Corp. (Los Angeles, Calif., U. S. A.)**. The manufacturers claim that the $98,000 instrument can pay for itself in one to three years.

SMALL, desk-sized analog computer is built to serve economy market.

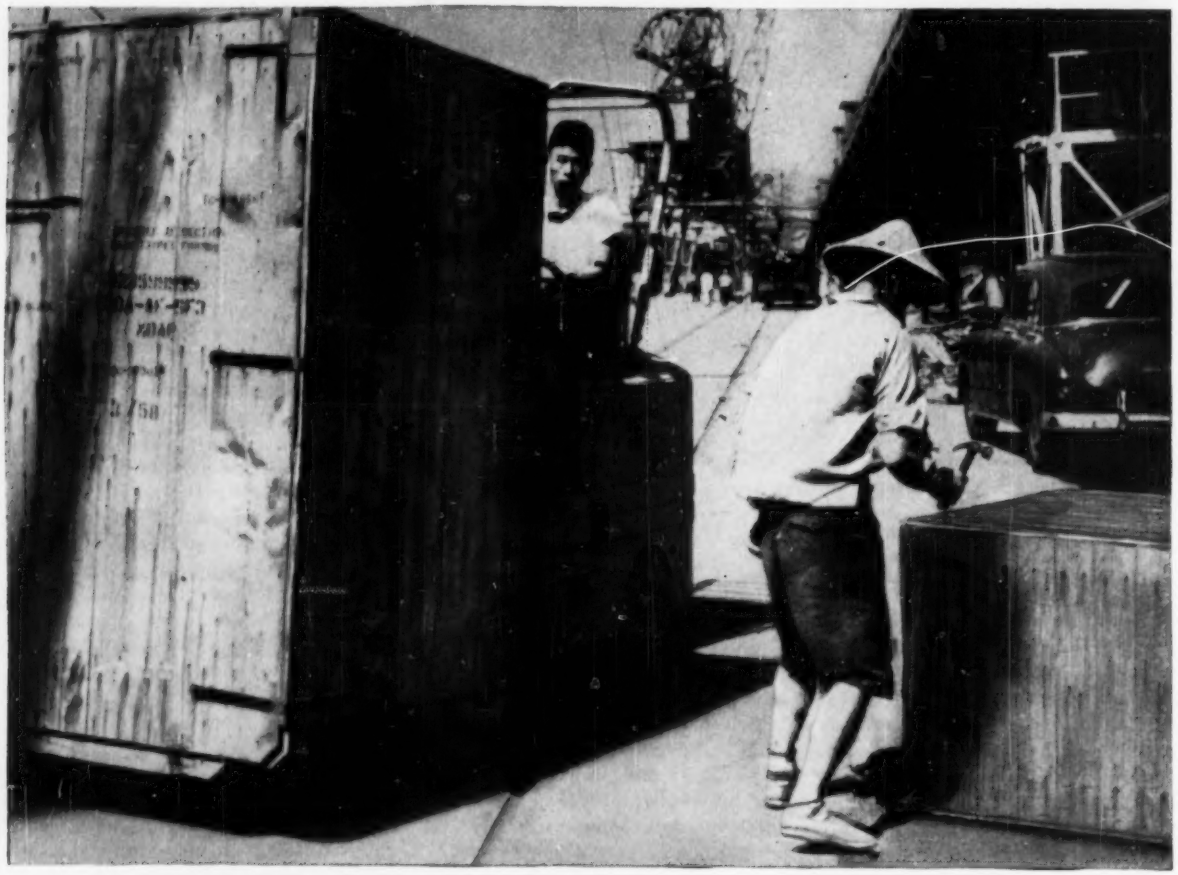
The RW-300, as it is called, uses transistors in place of tubes and a medium-speed magnetic drum that can store up to 7,936 words of arithmetic and control instructions and feed the information out at the rate of a word every 8.3 milliseconds. While this is slow by high-speed computer standards, it is sufficient for production control and makes it easier to keep the machine in good operating order.

One of the lowest-priced desk-size computers on the U. S. market is the new linear computer Model 3100 (picture, below), just developed by **Donner Scientific Co. (Concord, Calif., U. S. A.)**. It is priced at $15,035 and is said to be capable of solving problems as accurately as equipment priced at twice that figure. The 3100 has built-in provisions for working with non-linear input gear. All equipment is housed in a single desk-type console with the controls and the removable problem board within easy reach.

This computer is designed to let the purchaser start on a smallish scale and then build up. The minimum starting equipment is 10 amplifiers and 20 potentiometers. Several full consoles can be interconnected through their problem boards to work as a single system.

Economies have also been effected in new electronic control devices of more than medium size. The "Mercury" digital computer, built by the British company **Ferranti Ltd. (Hollinwood, Lancs., England)** for large-scale research work sells for only about $280,000; **Burroughs Corp.'s** "Datatron 220" **(6071 2nd Blvd., Detroit, Mich., U. S. A.)** for roughly $500,000. One reason given by Burroughs for the relatively moderate price of its latest giant computer is that the greater reliability of electronic parts now available makes it possible to cut out computer parts which are used for checking purposes only. Some 40% of the cost of most large computers is in checking parts, compared with about 5% in the case of the Datatron 220. ●

## FOR THE WORLD'S WORK: YALE lift trucks



# POWERFUL YALE INDUSTRIAL LIFT TRUCKS HANDLE BIG, AWKWARD LOADS FAST...ECONOMICALLY

Heavy, awkward loads present no handling problem when Yale Industrial Lift Trucks are on the job. These rugged, versatile trucks lift, move and stack any load—regardless of size, shape or weight—with maximum ease and efficiency.

This smooth operation of Yale trucks means a steady flow of materials...more work volume per day ...greater safety for workers...savings in time, space and manpower...substantial reductions in handling costs.

Find out how Yale trucks can step up production in your factory, speed shipments on your loading dock or make full use of your storage facilities. The complete Yale line of petrol, electric, diesel and hand lift trucks permits you to choose the Yale trucks that meet your specific handling needs *exactly*.

And, whatever Yale trucks you select, wherever you buy them—you can be sure they include the most advanced engineering features. Yale trucks are available in currencies of the Free World. Write or call your Yale Sales and Service Representative for complete information.

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**INDUSTRIAL LIFT TRUCKS**

YALE & TOWNE

THE YALE & TOWNE MFG. CO.
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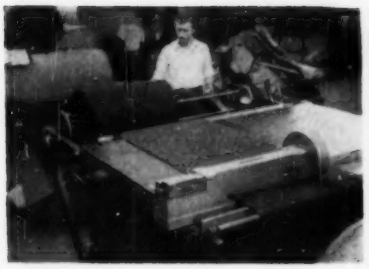
Yale Sales and Service Representatives are located in Principal Cities of the World



## Measures & Rolls Heavy Fabrics

Inspecting, rolling, and measuring heavy fabrics are the duty of this machine, which will handle goods already rolled without centers or goods that have been doubled and rolled on boards.

A roller cradle at the entering end accommodates goods that are to be run through the machine. The goods are batched on rods which are withdrawn from the fabric when the necessary length has been run. **G. Durrant & Sons Ltd., Stockport, England.**

## Lift Truck Has Ramp and Gate

A pre-fabricated loading ramp and automatic gate are available with this company's "Hoistower" lift trucks. The ramp needs no nuts or bolts and can be quickly installed on either side of the base; it stays in place as the platform is raised and lowered. The gate closes when the platform is raised and opens as it is lowered. **Buck Equipment Corp., 720-X Anderson Ferry Rd., Cincinnati, Ohio, U. S. A.**

## Motorized Jack

3-ton trucks like this one can be drawn with the minimum of effort with the help of a new electrically-driven jack. It is operated by pressing a button and is capable of pulling vehicles up to 10 tons in weight. The jack may be the answer to parking lot problems, making it possible for vehicles to be parked closer together than the average driver would be able to maneuver them. **Lansing Bagnall Ltd., Basingstoke, Hants., England.**

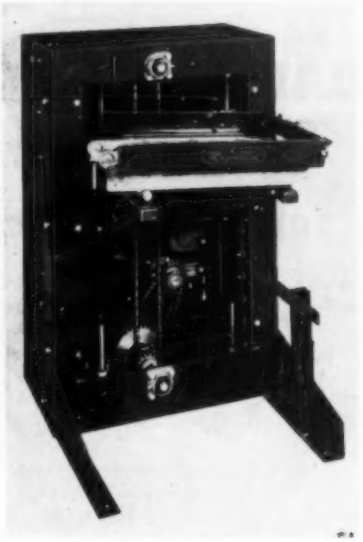
## For Speedier Materials-Crushing

Up to five manual processing and handling operations in chemical plants are combined in a new automatic steel breaker-conveyor. The unit consists of a chemical breaker and a screw conveyor driven by the same motor as the breaker drum. Materials are crushed and delivered to storage silos in one operation, eliminating the usual palletized drum handling between operations. Semi-friable bulk materials from ½-inch to 5 inches can be handled by the breaker, which is said to be capable of crushing up to 100 tons of solidified chemicals per hour. **Gifford-Wood Co., Hudson, New York, U. S. A.**

## Hydraulic Excavator Has 40 MPH Road Speed

Hydraulic operation, 360° swing, and speeds up to 40 miles per hour are features of the B-4 Hydra-X-Cavator-Crane.

The back-hoe attachment has a digging depth of 11½ feet and can be used to load high-sided trucks —over the front, if necessary. Other available attachments include shovel, crane, clamshell, ditch cleaner, and catch basin cleaner. **Davis Engineering, Inc., Benton Harbor, Michigan, U. S. A.**



**1.** Cartons from upper track slide onto platform which descends, . . .

**2.** . . . moves goods onto lower track, then returns to upper level.

# Reverses Materials Flow

This vertical transfer unit is designed to change the direction of materials flow on a conveying system. The change is made—without the use of 180° curved conveyor sections—by a vertical lift which operates automatically and in minimum space.

The unit can be placed at the end of two conveyor lines located in a direct vertical plane, and spaced to allow clearance for the materials being handled. Cartons from the upper conveyor track flow onto the lift platform, starting a switch which causes the platform to descend. When the cartons have been tilted onto the lower track the platform automatically returns to the higher position. **Rapids-Standard Co., Inc., Grand Rapids 2, Michigan, U. S. A.**

# STEPHEN S-A ADAMSON IDLERS offer a combination of *Quality* features that assure dependable, full capacity conveying!

Profitable conveying demands maximum performance and troublefree service from the conveyor idlers. Down time is costly and you usually pay the price of buying "something just as good" through costly breakdowns. There is no substitute for quality . . . the combination of quality features found only in S-A IDLERS assure maximum performance and dependable, trouble-free operation with less maintenance . . . even under the most severe conveying conditions.

- **SPUN END, ONE PIECE ROLLERS** . . . consisting of carrying surface and ends spun from a single piece of heavy gauge steel tubing plus an inner bearing tube welded to the spun ends. Rollers are available in 4", 5" and 6" diameter.
- **PERMANENTLY SEALED** . . . precision ball bearings are protected by a die-cast double labyrinth seal which will not corrode or wear . . . insures lasting protection of bearings from dirt and moisture.
- **PRE-LUBRICATED** . . . sufficient grease to last the normal life of each idler is sealed into each roller at the factory. Alemite fittings also provided for easy re-lubrication if necessary.
- **QUICK-CHANGE ROLLERS** . . . pre-adjusted rollers slide easily in or out of the hex-slots in the supporting brackets . . . providing fast roller changes without the use of tools.

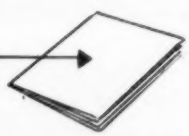
**S-A BELT CLEANER**

Protects and extends the life of valuable belts. The spring-blade wipes wet or dry particles from belts. Adjustable to any width . . . easily installed . . . no moving parts . . . no power drive required. Request Bulletin 1754.

**S-A HOLDBACKS**

Mounts on headshafts of belt conveyors and bucket elevators to prevent reversal under load in case of power failure. Safeguards personnel and equipment. Quickly and easily mounted . . . engages with instant positive grip but without shock. No ratchet to become fouled. Request Bulletin 155.

## —WRITE TODAY



. . . for complete information.
Request Bulletin 355.

STANDARD PRODUCTS DIVISION
**STEPHEN S-ADAMSON MFG. CO.**
123 Ridgeway Ave. Aurora, Illinois

## Truck That Lifts and Hauls

This semi-trailer truck is built to lift and haul loads of up to 5 tons. The trailer body, cradled between booms, is positioned hydraulically from ground level to a height of 9 feet. The booms are joined by a torsion bar to synchronize the motion of the lifting cylinders. Oil pressure is supplied by a gear pump driven by the tractor motor, and flow-control valves limit the speed when the load is lowered. **Wumag Waggon u. Maschinenbau GmbH, Krefeld, West Germany.**

## "Box-on-Wheels"

Space-saving and easy maintenance are the aims of this new truck. Its aluminum body, without cab or fenders, reduces maintenance to a minimum, while its 22-foot length, with the exception of the driver's cubicle, can be used as loading space.

Although protected by partitions within the body of the truck, the driver has sufficient space to walk from his seat to the dock and so can work the dock without leaving the vehicle.

It is possible for two "Wolf-wagon" trucks, one behind the other, to be operated by a single driver—provided each is equipped for highway service. In this case the engine and brakes of the second truck work simultaneously with those of the first. The trucks can in this way be used for pick-up and delivery service during the day and at night as power doubles, with a consequent saving in manpower. **Wolf Engineering Co., Dallas, Texas, U. S. A.**

### Adjustable Angular Torch Head

A very wide range—250°—is claimed for a new angular machine-torch adapter. The cutting angle can be set without tools and without removing the accessory from the torch. Any required angle can be set between 0° and 90° either side of vertical, and within an additional 35° above horizontal. Both sides of the body bear indexing marks in increments of 5°. Vertical and horizontal cutting, bevel cutting, flanging, and various types of structural shape cutting all come within the scope of the new unit. **Air Reduction Co., Inc., 150 East 42nd St., New York 17, New York, U. S. A.**

### Upright Flame-Cutter

A new upright flame-cutting machine is designed to enable small and medium-sized workshops to cut form pieces after templates or to make flanges economically. A magnetic roller is installed in a resistant-to-bending jointed frame

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A WORLD-WIDE ANNOUNCEMENT!

# NEW THAMES 800 RANGE

FORD ENGLAND

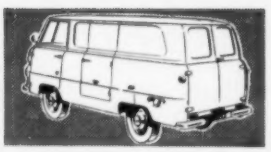
. . . and we mean NEW! New in scientifically balanced construction . . . new in advanced design . . . new in forward control with ¾ ton payload capacity and big unobstructed floor area . . . new in low-loading height . . . new in functional styling . . . new in advanced mechanical features.

**PLUS THESE EXTRA NEW FEATURES . . .**

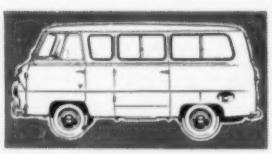
NEW all-steel construction. NEW "outrigger" type chassis frame (perfect for special bodies). NEW full width double rear door opening with optional side door if required. NEW independent ball joint front suspension. NEW hydraulic brakes—area 147 sq. inches—the biggest! NEW foam rubber seating and, for the first time ever, a 'step-in' entrance by either front door! (Yes, once again, driver comfort has been given every consideration). NEW safety glass single-piece curved windscreen. NEW lever-type handbrake. NEW built-in flashing indicators. NEW twin windscreen wipers with overlapping arcs. NEW serviceability. NEW standards of manoeuvrability.

PLUS the famous 1703 c.c. Consul engine.

See all the advanced features of the New Thames 800 Range—TODAY!



*Available with an optional side-loading door as well as the full width double rear doors—the new "Thames 800" Freighter is way ahead in practical features and mechanical construction.*



*Available soon will be the Thames 800 Estate Car and Express bus and the Thames 800 chassis cab and chassis front end for any special body you may have in mind.*

*Ask your Dealer for details of the Thames 800 Range.*

FORD MOTOR COMPANY LTD · ENGLAND

above the cutter. It is driven by an electric motor over a transmission gear and rolls along an interchangeable template. The magnetic coil is fed with 24 volts DC over a transformer with built-in rectifier. Cutting speed can be controlled over a rotating sliding resistance. The machine is vertically adjustable for cutting plates from ½-inch to 4 inches. **J. & W. Mueller GmbH, Opladen, Rhineland, Germany.**

## Chews Up Secrets

Secret documents can be disposed of with a minimum of trouble with this new electric grinder. Instead of having to watch while the papers are burned, all the user has to do is drop the documents, staples and all, in the top of the machine and turn on the 3-horsepower electric motor. The paper mixes with reusable water and is ground to pulp by the blades in a few minutes. The pulp is fed out of the machine into a receptacle which can be emptied along with ordinary office trash. **Meili & Worthington Inc., Hatboro, Pennsylvania, U. S. A.**

## Marking Your Products

A new offset marking machine, the Markem Mode! PAM-AG, uses interchangeable work-holding fix-

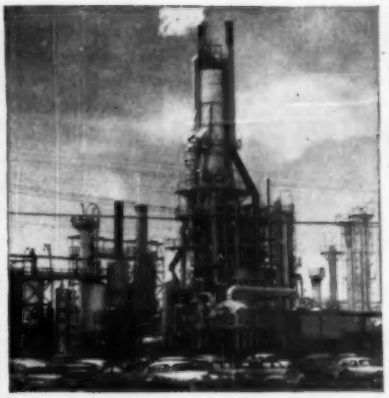
tures to handle various cylindrical, tapered, conical, or wire lead objects, ⅛-inch to 2½-inch, that cannot be chute fed. Typical items include bottles, vials, cans, transistors, capacitors, solenoids. The unit will mark a maximum imprint area of 3 inches by 2¾ inches. Recommended operating speed is 50 to 60 objects per minute, but the rate is said to be adjustable. **Markem Machine Co., Keene 82, New Hampshire, U. S. A.**

## Screw Jacks

A new line of worm gear screw jacks can be used in any position—for precision jacking, pushing and pulling operations, and for linear action. Power source can be either manual or motor with a reducer unit. Four-way miter box assemblies are available for multiple systems requiring synchronization. **Joyce-Dridland Co., Dayton, Ohio, U. S. A.**

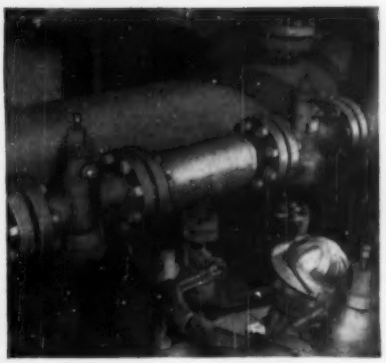
## Heavy Duty Nailing Machine

This hydraulically operated nailer—said to be capable of driving 24 nails through hard oak in a single stroke—can be adjusted for driving nails in the 4- to 20-penny range. Selection of nail-

# News of ROCKWELL

**NEW REFINING PROCESSES** create a constant demand for new and more efficient production equipment. Rockwell Manufacturing Company, as the world's largest and leading manufacturer of meters, valves and regulators has won a world-wide reputation for keeping pace with—and often anticipating—the rapid changes in the refining industry. For every new refinery process, there are Rockwell measurement and flow control products to help increase production and cut costs.



**CONTINUOUS PROCESSING** stays continuous when Rockwell-Nordstrom valves (like the ones shown at left) are used for refinery flow control. They assure *positive* control of lightest gases or heaviest liquids because they are lubricant sealed for safe, leakproof shut-off. And Rockwell-Nordstrom valves cost less to use and stay in service longer because lubricant prevents metal-to-metal wearing friction. Rockwell Manufacturing Company produces the world's most complete line of lubricated plug valves and lubricants for every refining need.

**PRODUCTION COST** and quality control records are always accurate when you use Rockwell ER liquid meters in key processing operations. A wide selection of operating accessories (like the automatic printing register and pre-determining valve shown on meter at left) make them far more versatile than any other meter. And because they are designed, built and field tested by Rockwell, they stay accurate longer at lower cost. For complete details on Rockwell measurement and control products, contact your nearest representative.

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*Satam, S.A., Brussels II* (Industrial Meter Products)

**FRANCE:** *Audco France S.A., Paris 15* (Valve Products)
*Satam, Paris 8e,* (Industrial Meter Products)

**GERMANY:** *Deutsche Audco Rockwell GmbH, Bielefeld*

**GREECE:** *I. I. Angelopoulos-N.D. Koutroufiotis, Athens*

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**KUWAIT (ARABIA):** *International Trading Agency*

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**SWITZERLAND:** *Technogas, S.A.R.L., Lausanne*

**TRINIDAD:** *Neal & Massy Engineering Co., Ltd., Port of Spain*

**TURKEY:** *Yakin Dogu Makine A.S., Istanbul*

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*Astral Industrial Meter, Ltd., Crawley, Sussex* (Industrial Meter Products)

**FORMOSA:** *Allied Engineering Service, Taipei, Taiwan*

**INDIA:** *Tahira Industries (India) Ltd., Bombay 2*

**PHILIPPINES:** *Florencio Reyes & Company, Inc., Manila* (Water & Gas Meters)
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# Euclids Move the Earth ...ore, rock, coal and logs, too!

**MINES & QUARRIES** depend on "Eucs" to move big loads on tough hauls because they're designed and built for this heavy duty work.

**DAMS,** both earthfill and concrete, involve tremendous yardages of excavation that must be moved . . . earth, rock, aggregate etc. "Eucs" have worked on practically every major dam built during the past 25 years.

**HIGHWAYS** are built with modern earthmovers like this Twin-Power all-wheel drive scraper that has 2 engines for a total of 518 h.p. and a payload capacity of 32 cu. yds.

**LOGGING** requires equipment that can move big loads on long, difficult hauls at low cost.

WHEREVER large tonnages of material must be moved in mine, quarry and heavy construction work, the chances are good that Euclid equipment is doing the job. Built to carry off-highway payloads of 10 to 50 tons, "Eucs" are speeding the construction of our new roads . . . dams that prevent floods and provide power . . . airports, railroad relocations and plant sites.

They are helping to step up production and cut costs in open-pit mines and quarries . . . in logging . . . and on many industrial operations. All over the world, on all kinds of jobs, Euclids are moving big loads at lowest cost.

If heavy earth moving equipment is used in your operations, we'll be glad to put you in touch with the Euclid dealer in your territory so you'll have complete information on the types and models that meet your specific needs. He can show you why ***Euclids are your best equipment investment.***

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**Newhouse, Lanarkshire, Scotland**

GM GENERAL MOTORS EUCLID

# EUCLID PRODUCTS

ing design is done automatically through the electric control panel. **Food Machinery & Chemical Corp., P. O. Box 760, San Jose 6, California, U. S. A.**

## For Rapid Measurement of Moisture & Density

Accurate moisture or density determinations can be made in 2 minutes according to the makers of the "d/M-Gage". It is a radioactive portable field instrument designed for use in the manufacture of raw materials, chemicals and fertilizers, but which can be adapted for sub-soil moisture or density measurement in civil engineering.

Measurements can be made at depths of up to 60 feet. **Nuclear-Chicago Corp., 229 West Erie Street, Chicago 10, Illinois, U. S. A.**

## Versatile Copier

The machine shown above,

**Continued on page 67**

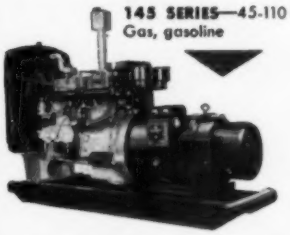

*NOW— a complete line of*

# WAUKESHA

## Industrial ENGINATORS®

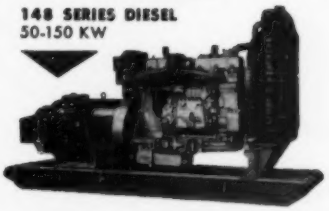
*50-700 KW • NATURAL GAS • LPG • GASOLINE • DIESEL*

**145 SERIES**—45-110 KW
Gas, gasoline

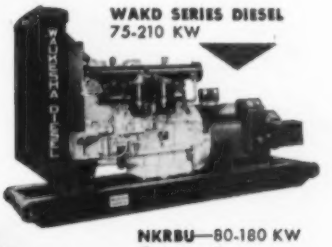


A superb line of Enginators— backed by over 50 years' experience in building heavy-duty engines and electrical equipment. For reliable performance on all fuels, these accurately balanced Waukesha engine-generator combination units supply smooth, steady power in continuous, intermittent and standby service.

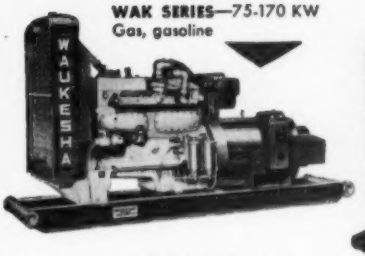
**148 SERIES DIESEL**
50-150 KW



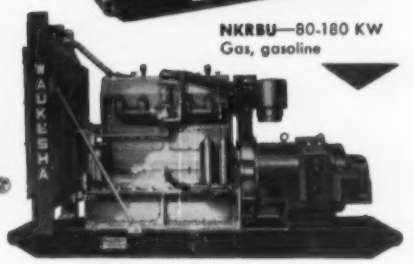
**WAKD SERIES DIESEL**
75-210 KW



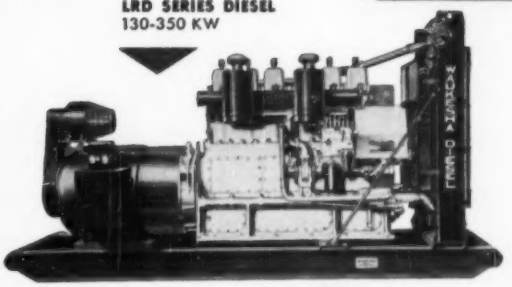
**WAK SERIES**—75-170 KW
Gas, gasoline



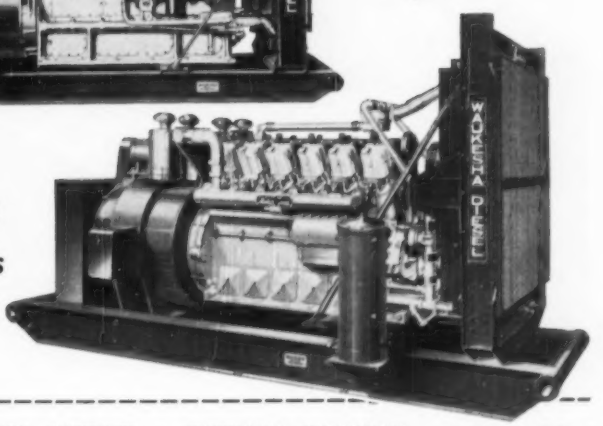
**NKRBU**—80-180 KW
Gas, gasoline



**LRD SERIES DIESEL**
130-350 KW



**VLR SERIES**—250-730 KW
LPG, natural gas, Diesel



*WRITE FOR BULLETINS FOR THESE AND OTHER MODELS*

333

**WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN** *RAILWAY DIVISION*

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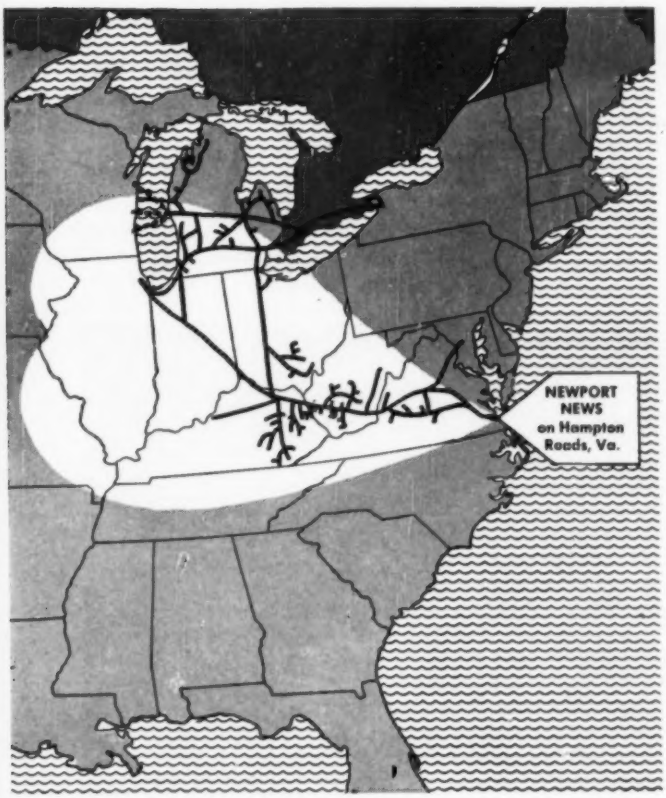
# One of the world's great harbors

Newport News is on Hampton Roads, Virginia —one of the finest natural harbors in the world. Well protected; ice free; deep channels. It is the second busiest harbor in America, with a sailing on the average of every sixty minutes. Over 90 regularly scheduled steamship lines connect it with over 225 world ports.




## Closer to the Heart of America

Because Newport News, Virginia, is actually closer to the great industrial and agricultural areas of the Midwest and Midsouth, it enjoys a lower inland freight rate than other North Atlantic ports. Shipping times are generally faster, too.

## *These Factors Make Newport News a Great Seaport*

- strategic location
- efficient handling equipment
- storage-in-transit. Over 37 million cubic feet of warehousing facilities
- export packing service
- large covered merchandise piers plus open piers with modern facilities for bulk cargo
- coordinated rail-and-sea transport

Chesapeake and Ohio's World Commerce Department assists exporters, importers, forwarding agents, steamship operators on all matters relating to rail and ocean shipping of overseas and intercoastal freight. Write for free illustrated booklet telling why it's easier to use the C&O Port of Newport News.

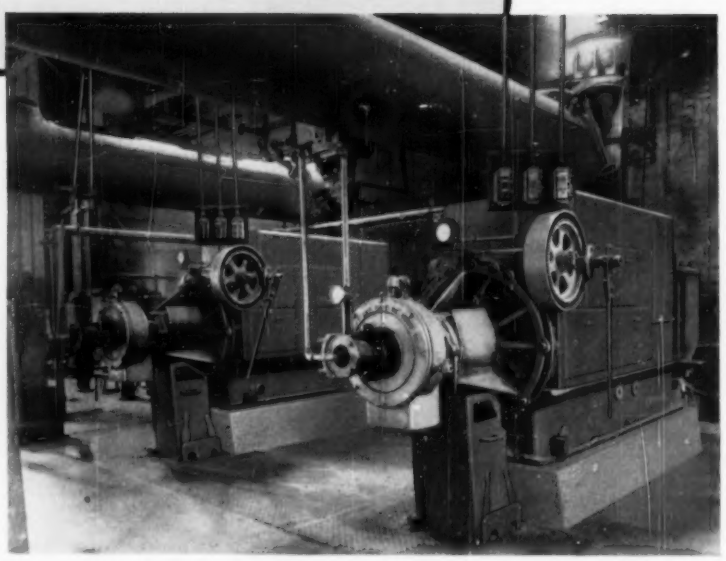
## Chesapeake and Ohio Railway

WORLD COMMERCE DEPARTMENT, NEWPORT NEWS, VA.

*World Commerce Dept. Offices:* New York 7, N. Y., 233 Broadway • Chicago 4, Ill., 327 S. LaSalle Bldg. Detroit 26, Mich., 525 Lafayette Bldg. • Richmond 10,Va., 909 East Main St. • Stockholm, Sweden, Kungsgatan 7

# THE NEW SUPER-DUO 55 EXPELLER HAS CRASHED THE 3% BARRIER AT 50 TONS PER DAY!

| | cottonseed | peanuts |
|---|---|---|
| CAPACITY | 51 | 50 |
| % MOISTURE | 8.03 | 1.20 |
| % OIL | 2.84 | 3.20 |
| % AMMONIA | 7.98 | 9.63 |
| % PROTEIN | 41.00 | 49.50 |
| % NITROGEN | 6.56 | 7.92 |
| STANDARD | 36 | 33 |



These figures show how the new Anderson 55 Expeller has "broken" the 3% barrier on cottonseed at a capacity of 50 tons/day, and obtained equally outstanding results on other materials. The versatile Super-Duo 55 is producing cake at high capacities with unbelievably low residual oils on a variety of materials. This new model of the famous Anderson High Capacity Expeller fills your need for a high production machine that obtains remarkably low residual oils. If you are modernizing or expanding, be sure to write for complete information on the Super-Duo 55. Anderson engineers in many instances can convert your present Expeller equipment to this new machine. Send for full details today.

## THE V. D. ANDERSON COMPANY

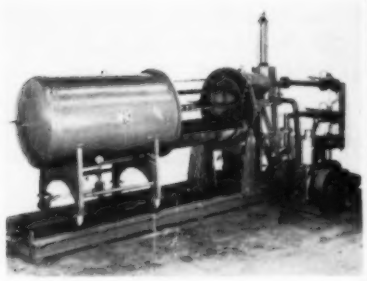
division of International Basic Economy Corporation

**1962 WEST 96th STREET • CLEVELAND 2, OHIO**

which is designed to be carried like a brief case, has a plastic aircushion which enables it to reproduce book pages (face downwards) and (face up) reports, invoices, and other papers. Cost of operating the machine is about 11 cents per page. **Luden Associates, Inc., 330 South Compo Road, Westport, Connecticut, U. S. A.**

## Small Infra-red Oven

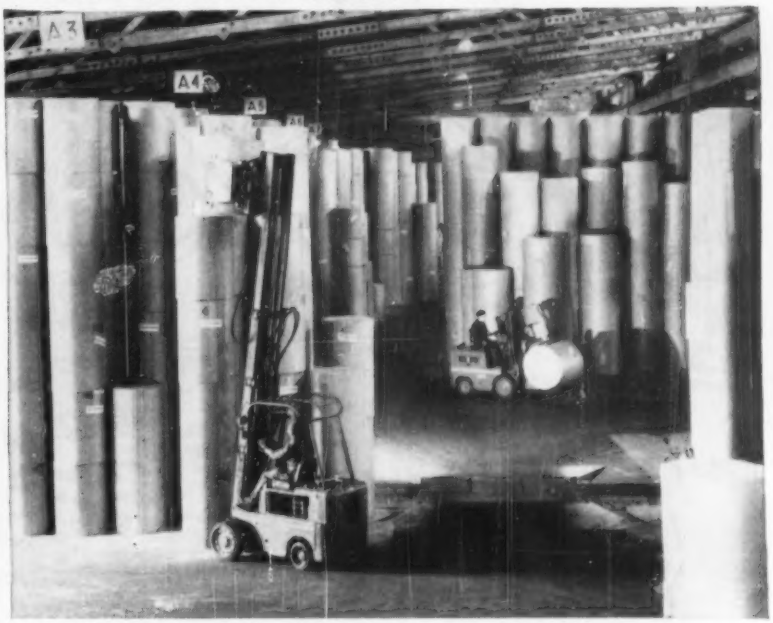
It is sometimes necessary to heat-process small articles and materials in batch production. A new infra-red oven specially designed for this purpose is claimed to be suitable for pre-heating, paint stoving, drying of lacquer, removal of moisture from chemicals and foodstuffs etc. It consists of a sheet-steel casing with infra-red, tubular, sheathed heating elements in anodized aluminum reflectors in the top of the oven, which heat the material on a shelf by direct radiation. **Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester 17, England.**



## Medium Vacuum Coater

The vacuum metallizing unit pictured above is a medium-capacity


# CLARK EQUIPMENT
*moves mountains . . .*



**. . . of paper rolls up, up, up!**

In the warehouse of a Finland paper company, CLARK trucks stack 3500 lb paper rolls to the rafters. Clark designed these machines especially for this job. Their remarkable high-lift conserves storage space, facilitates stock segregation, speeds handling, and reduces damage. These economies explain why, throughout the world, progressive companies being their material handling problems to Clark—and achieve savings like these.

**. . . sand and gravel**

Near Leopoldville, Belgian Congo, MICHIGAN Tractor Shovel loads 5 yard trucks in 2 minutes each. The MICHIGAN operates so simply that unskilled workers become proficient after only a few hours of training. Speeds and direction are changed merely by moving two small levers.

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Associated Manufacturers in Australia, Belgium, France, Germany and U.S.A.

# *Adding youth to steel...for you*

## Just a "pinch" of vanadium helps steel to serve you better

STEEL IS LIKE PEOPLE. It, too, can become tired with too much shock and strain or too much exertion. Fortunately for all of us, scientists have learned the secret of imparting the stamina of youth to steel.

**SECRET OF YOUTH**—It's done by adding small amounts of vanadium—often with other alloying metals—to the molten steel, usually as it comes from the steelmaker's furnace.

Thus, the springs of your car and other hard-working parts of automobiles, locomotives, ships, and aircraft withstand constant shock and strain.

**WHAT IS VANADIUM?** This special tonic for steel is one of the earth's rarer metals. However, it is widely distributed in the earth's crust. After being concentrated and smelted, the refined metal is shipped to the steelmakers.

Vanadium is but one of many alloying metals that are used to improve today's steel. Just as vanadium makes steel shock-resistant and enduring, chromium makes it rust-resistant, tungsten makes it strong at high temperatures, manganese makes it tough at low temperatures, and silicon gives it important electrical properties.

**UCC AND ALLOYS**—The people of Union Carbide produce more than fifty different kinds of alloying metals, in hundreds of varying compositions and sizes. They also work closely with steelmakers in developing and improving the alloy steels that go into nearly everything that serves us today.

**FREE:** *Learn more about the interesting things you use every day. Write for the illustrated booklet "Products and Processes" which tells how science and industry use the* ALLOYS, CARBONS, CHEMICALS, WELDING EQUIPMENT, and PLASTICS *made by Union Carbide. Ask for booklet IMD-12.*

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machine intended for moderate-sized coating operations. It can, however, be adapted as production grows since the jig rods and work-holding fixtures are interchangeable with those of the same company's larger machines. Length of the coating chamber is 5 feet; diameter 42 inches. **NRC Equipment Corporation, 160 Charlemont Street, Newton Highlands 61, Massachusetts, U. S. A.**

## Mobile Loader Unit Has Extra High Lift

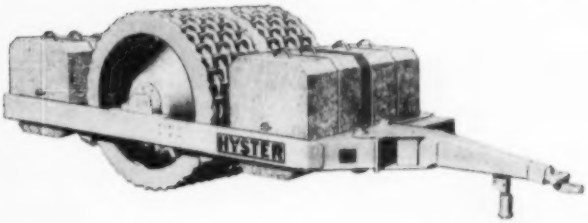
Various attachments—telescopic towers, concrete buckets, cranes, and adjustable-width lifting forks—make this high-reaching lift-loader adaptable to use in a number of industries.

The "Sky-Hy Lift" is available with 18½, 25½ or 29½-foot lifting heights. **Lull Eng. Co., 3045 Highway 13, St. Paul 11, Minnesota, U. S. A.**

## Strip-Chart Recorder

A new electronic recorder, called the Dynamaster, will automatically plot a continuous curve showing the relationship of one measured variable to another. Recordings are made on a 12-inch strip chart at pen speeds of up to 0.4 seconds for full scale traverse. The instrument is designed to be used in the process industries, the automotive industry, papermaking, and aerodynamic research. **Bristol Company, Waterbury 20, Connecticut, U. S. A.**


***HIGH-SPEED***
**COMPACTION**
***LOW-COST***
**ROCK CRUSHING**
***EFFICIENT***
**BITUMINOUS SALVAGE**




**THE HYSTER "GRID" ROLLER DOES ALL THREE**

***Here is the machine road builders all over the world are using on all types of road construction—freeways, secondary roads, farm-to-market roads, access and logging roads.***

Built for long life on any job — rock surfacing haul roads or high-speed compaction on expressways — the "Grid" roller is designed to give you low cost operation and maintenance. Its high capacity tapered roller bearings give long life. Its high-strength cast steel wheels resist wear in rock and abrasive materials. The heavy-duty frame prevents distortion in the toughest going.

1 EMBANKMENT COMPACTION—High-speed rolling (up to 15 MPH towed by Caterpillar DW15 Tractor) matches compaction with yardage of high-speed earth movers.

2 ROCK CRUSHING — Pit-run rock quickly and efficiently crushed for base and surface courses on secondary road construction and repair.

3 BITUMINOUS SALVAGE — Quickly breaking down old ripped-up mat, the "Grid" Roller salvages all of the original aggregate and reusable binder for use in new surface.

**HYSTER COMPANY**

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# Cuban sugar companies order 15 General Electric diesel-electric locomotives

In an effort to increase operating efficiency and hauling capacity, two leading sugar companies in Cuba are replacing steam equipment with new General Electric diesel-electric locomotives.

Twelve of the fifteen 720 hp (70 ton) units were ordered by the Cuban Dominican Sales Corporation, a subsidiary of West Indies Sugar Corporation. These new locomotives will join four other G-E diesel-electrics already in use by the concern, making it the first completely diesel-electrified Cuban sugar company. At the four plantations of the West Indies Sugar Corporation, with their 550 km of track, these locomotives will handle 1300 cane cars, each with a thirty-ton capacity.

Three 70-ton diesel-electrics were ordered by the Manati Sugar Company. Manati already has a 70-ton and a 35-ton G-E locomotive.

There's an increased demand in industry today for G-E locomotives. General Electric builds a complete line of diesel-electric industrial locomotives to meet diversified needs, ranging from 25-ton, 150 hp to 88-ton, 1200 hp units.

General Electric diesel-electric industrial locomotives can serve your company's needs. For complete information, contact your nearest International General Electric Company representative. (120-E6)

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

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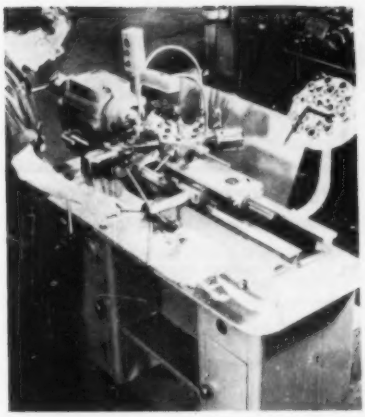

## For Short-Run Work

A low-cost, hand-screw machine has been developed for the economical production of a limited number of precision parts—from washers and shafts to tools used in the electronics or aircraft industries. Its makers claim that the unit will machine 50 parts in the time taken to produce one on an engine lathe. New features include:

—bed turret with 6 stations for up to 6 operations.

—pilot wheel feed, with 8-inch travel.

—T-slots in the tool post pad and slide for varied tool positioning. **Rockwell Mfg. Co., Delta Power Tool Div., 400 N. Lexington Ave., Pittsburgh 8, Pennsylvania, U.S.A.**

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Of McGraw-Hill International Management Digest, published monthly at Albany, New York for October 1, 1957.

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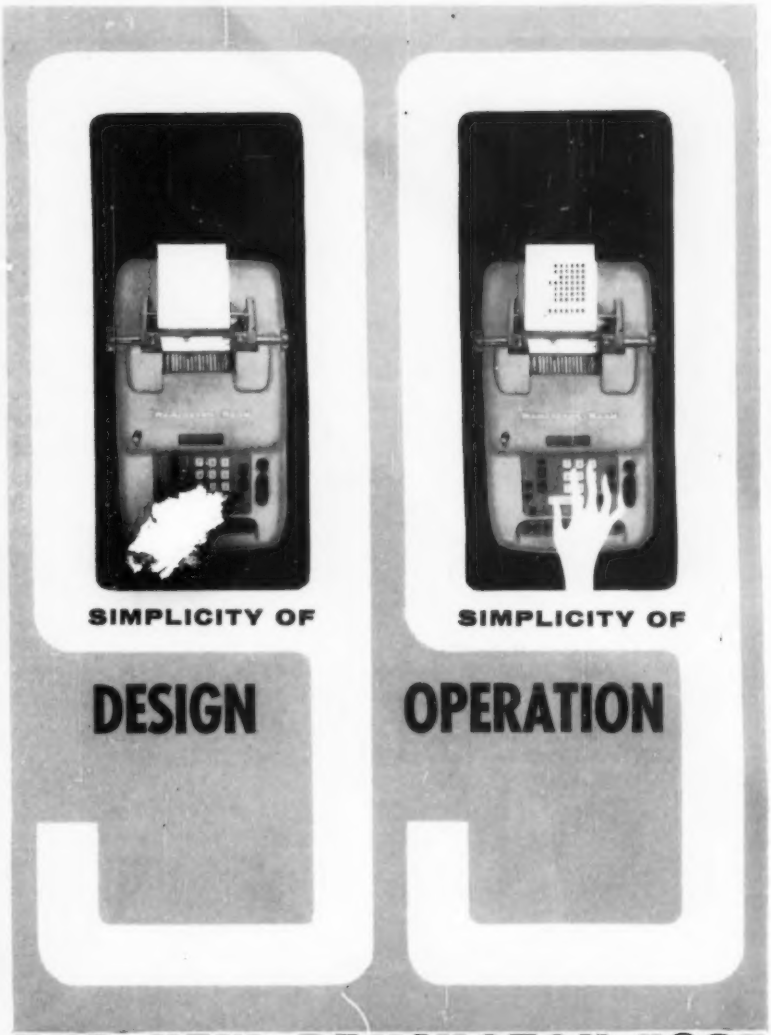
By JOHN J. COOKE, Secretary.

Sworn to and subscribed before me this 3rd day of September, 1957.

[SEAL] JANET A. HARTWICK.
(My Commission expires March 30, 1959)

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The feminine lines of today's fashions, with their soft, fluid fabrics, are at their best in acetate. Soft, graceful beauty is the special province of acetate the beauty fiber.

Remember, acetate opens up profitable fabric possibilities. Your Amcel representative is ready to bring you the latest fabric developments. And the technical know-how of the Celanese Corporation of America is yours for the asking.

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Rhodesia, Bulawayo . . . . . John Beith (Rhodesia) Pty. Ltd. . . . Chemicals.
So. Africa, Durban (Portuguese East Africa, Nyasaland) . . . John Beith (S. A.) Pty. Ltd. . . . Chemicals.
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Sweden, Stockholm . . . . Scandinavian Raw Materials . . . Plastics.
Switzerland, Basel . . . . . Chemische Fabrik Schweizerhall A. G. . . . Chemicals, plastics, resins & C. A.
Switzerland, Zurich . . . . . Walter Aebli & Co. . . . . Textile products.
Syria, Damascus . . . . . Sahmarani Hammour & Cie . . . . Textile products.
Taiwan (Formosa), Taipei . . . Dah Chung Trading Co. . . . Chemicals, plastics, resins & textile products.
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## ● YOUR MANAGEMENT READING

**Management Digest's editorial staff here again does the "worthwhile reading" for you to save your time. For the following literature, please write on your company letterhead directly to the address given, mentioning Management Digest.**

**Management I.**—"Organization: The Framework of Management" is a closely-packed reference work. It discusses job schedules, the roles of the specialist, of committees, of executive directors, and warns against the misuse of organization charts. 436 pages, 45s. or $6.30. (Longmans, Green & Co. Ltd., 6-7 Clifford Street, London W. 1, England.)

**Management II.**—Prof. C. N. Parkinson's wry diagnosis of the world's organizational ills first appeared in a magazine article several years ago; now his researches are compiled into a book, "Parkinson's Law." The law, roughly stated, is that the staff of any administrative department increases by 5% yearly "irrespective of the amount of work (if any) to be done." The Professor also offers his studies on how to succeed, how to make the boss retire (MD, May,p47), how to recognize a dying enterprise, how to discover the relative importance of people at a cocktail party. Don't laugh: Parkinson has a powerful, if humorous, message to management. 113 pages, $3.00. (Houghton Mifflin Co., 2 Park Street, Boston 7, Mass.)

**Two New Guidebooks**—The Aerosol Guide consolidates all the testing methods, regulations, and recommended practices developed by the fast-expanding pressurized packaging industry (see "Push-button Drugs" on another page in this issue). 96 pages, $8.00. (Chemical Specialties Manufacturers' Assn. Inc., 50 East 41st Street, New York 17, New York). . . . The Handbook of Powered Industrial Trucks contains case studies of truck applications, illustrates various types, suggests how to select the best for your materials-handling needs. 96 pages, $5.00. (Industrial Truck Assn. Ninth & F Streets, Washington 4, D. C.)

**Cost Accounting**—"Management Accounting For Profit Control" sets out the essentials of a cost accounting and budget planning program to fit a company's individual needs. 435 pages, $7.00. (McGraw-Hill Book Company Inc., 330 West 42nd Street, New York 36, New York.)

**Bulletins from Industry**—A 48-page catalog describes the complete line of Walker-Turner "light-heavyweight" machine tools and accessories. (Rockwell Mfg. Co., Walker-Turner Div., 400 N. Lexington Ave., Pittsburgh 8, Pennsylvania.) . . . Kodak materials and accessories for industrial radiography are presented in a 15-page bulletin. (Eastman Kodak Co., X-Ray Div., Rochester 4, New York.) . . . Industrial Issue No. 9 of LIFT magazine illustrates many of the materials-handling applications of Globe trans-o-matic ramps, electro-loaders, machine feed tables, bridge lifts and ramp eliminators. (Globe Hoist Company, East Mermaid Lane at Queen Street, Philadelphia 18, Pennsylvania.)

**Polyethylene**—A new manual covers the history, properties, chemistry, manufacture, and applications of this versatile plastic. 217 pages, $4.95. (Reinhold Publishing Corp., 430 Park Avenue, New York, New York.)

**Sharing the Profits**—Two new books will help you understand the potentials—and the problems—of profit-sharing. "Profit Sharing Manual —1957 Edition" discusses in detail basic types of schemes. $17.50. (Council of Profit Sharing Industries, 337 W. Madison Street, Chicago 6, Illinois.) . . . "Pension and Profit-Sharing Plans and Clauses" gives the full texts of 20 operating plans and samples from more than 300 others. $9.00. (Commerce Clearing House, 214 N. Michigan Ave., Chicago 1, Illinois.)

# Publications Digested

American Automobile
American Letter
American Machinist
Aviation Week
Business Education World
Business Week
Chemical Engineering
Chemical Week
Coal Age
Construction Methods & Equipment
Control Engineering
El Automovil Americano
Electrical Construction & Maintenance
Electrical Merchandising
Electrical West
Electrical Wholesaling
Electrical World
Electronics
Engineering & Mining Journal
E&MJ Metal & Mineral Markets
Engineering News-Record
Factory Management & Maintenance
Fleet Owner
Food Engineering
Industrial Distribution
Ingenieria Internacional Construccion
Ingenieria Internacional Industria
Metalworking Production (London)
National Petroleum News
Nucleonics
Petroleum Week
Power
Product Engineering
Purchasing Week
Textile World
Today's Secretary

McGraw-Hill Publishing Co., Inc. 330 W. 42nd St., New York 36, N. Y.

**American Builder, Marine Engineering, Railway Age, Railway Track and Structures, Railway Locomotive and Cars, Railway Signaling & Communications**
Simmons-Boardman Publishing Corp., 30 Church St., New York 17, N. Y.

**American Business**
Dartnell Publications, Inc., 4660 Ravenswood Ave., Chicago 40, Ill.

**Architectural Record**
F. W. Dodge Corp., 191 W. 40th St., New York 18, N. Y.

**Banking**
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